APRIL 18, 1955 SPECIAL REPORT: Mechanical Refrigeration . . . p. 49

RAILWAY AGE

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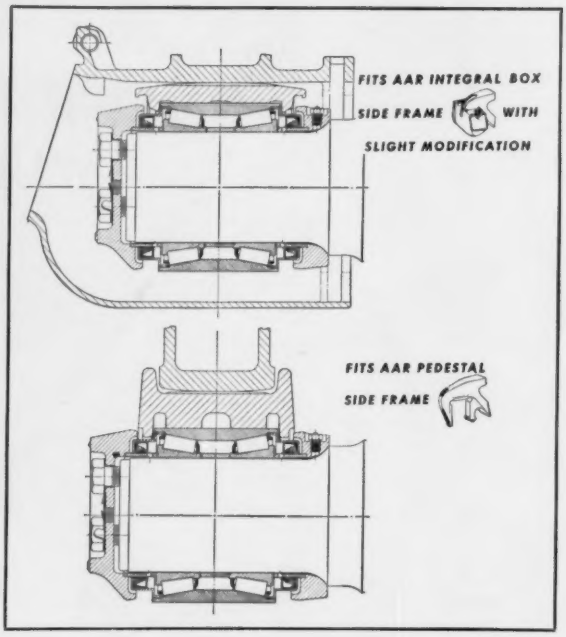
FREIGHT CAR ROLLER BEARING COSTS CUT 18% TO 25%

. . . with new TIMKEN® heavy-duty bearing assembly!



A REVOLUTIONARY new *heavy-duty* Timken® tapered roller bearing assembly cuts the cost of applying roller bearings to freight cars 18% to 25%.

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And it costs less to use because it's the first *heavy-duty* roller bearing assembly that fits all types of standard side frames. No need to carry two types of spare axle assemblies for replacement.

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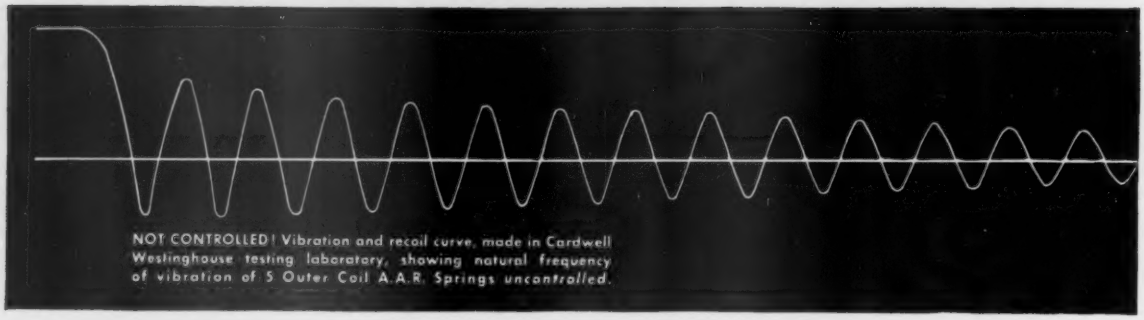

NOT CONTROLLED! Vibration and recoil curve, made in Cardwell Westinghouse testing laboratory, showing natural frequency of vibration of 5 Outer Coil A.A.R. Springs *uncontrolled*.

PORTRAIT OF A

S-M-O-O-T-H

FREIGHT CAR RIDE

CONTROLLED! Recoil curve made with one Cardwell Friction Bolster Spring assembled with 4 Outer Coil A.A.R. Springs. Oscillation has been *controlled* by friction — lading is *protected*.

a picture is worth 1,000 Oscillations!

Dramatic demonstration! See how the CARDWELL FRICTION BOLSTER SPRING dampens destructive oscillation in a freight car truck . . . with dependable friction.

This is Cardwell's answer to one of railroading's greatest problems . . . damaging, rhythmic vibration of compression and recoil of ordinary bolster springs in modern high speed operation. With CARDWELL FRICTION BOLSTER SPRINGS you can be sure of smooth-riding freight cars even at today's high speeds. You can be sure, too, that both lading and rolling stock are protected; maintenance and damage claim costs reduced.

Dollar for dollar you can't buy better or smoother riding results! For A.A.R. standard and long-travel springs.

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Cardwell R-20 Rubber Draft Gear
Cardwell M-25 Friction Draft Gear
Westinghouse Friction Draft Gear

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BECAUSE of the effects of excessive vibration, maintenance costs in most railway bridges run fairly high. Yet, when the steel members are joined with Bethlehem High-Strength Bolts, maintenance costs are materially reduced.

Bethlehem High-Strength Bolts make possible lower maintenance costs because they retain their full clamping force. The bolts combine with two hardened washers — one under the hexagonal head, the other under the hexagonal nut. The nut is driven up on the bolt to predetermined tension with a calibrated pneumatic impact wrench, resulting in tremendous clamping pressure. Another advantage of Bethlehem High-Strength Bolts is a saving in installation time.

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In this typical railway-bridge installation, Bethlehem High-Strength Bolts are used to connect the knee braces, which support the cantilevered portion of the solid railroad deck, outside the main girders.

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April 18, 1955 **Vol. 138, No. 16**

Week at a Glance

ICC powers would be substantially trimmed, if a "Hoover Commission" report on government legal services and procedure should be adopted in full by Congress. 10

"Loadability" and volume would be the criteria for freight charges, under a revolutionary new rate-making plan proposed for British Railways. 11

A new world record for railroad speed—207 mph on standard track with only-slightly-altered standard equipment—has been established by the French National Railroads. 12

February net income for Class I railroads, up just 100% compared with the same month last year, reflects somewhat lower expenses in the face of a small increase in gross. 15

FORUM—What about the "Cabinet Report"? If and when it comes out, will its recommendations be favorable to the railroads or merely political in nature? We don't know and don't think educational efforts by the railroads should be suspended in anticipation of the issuance and content of the report. 45

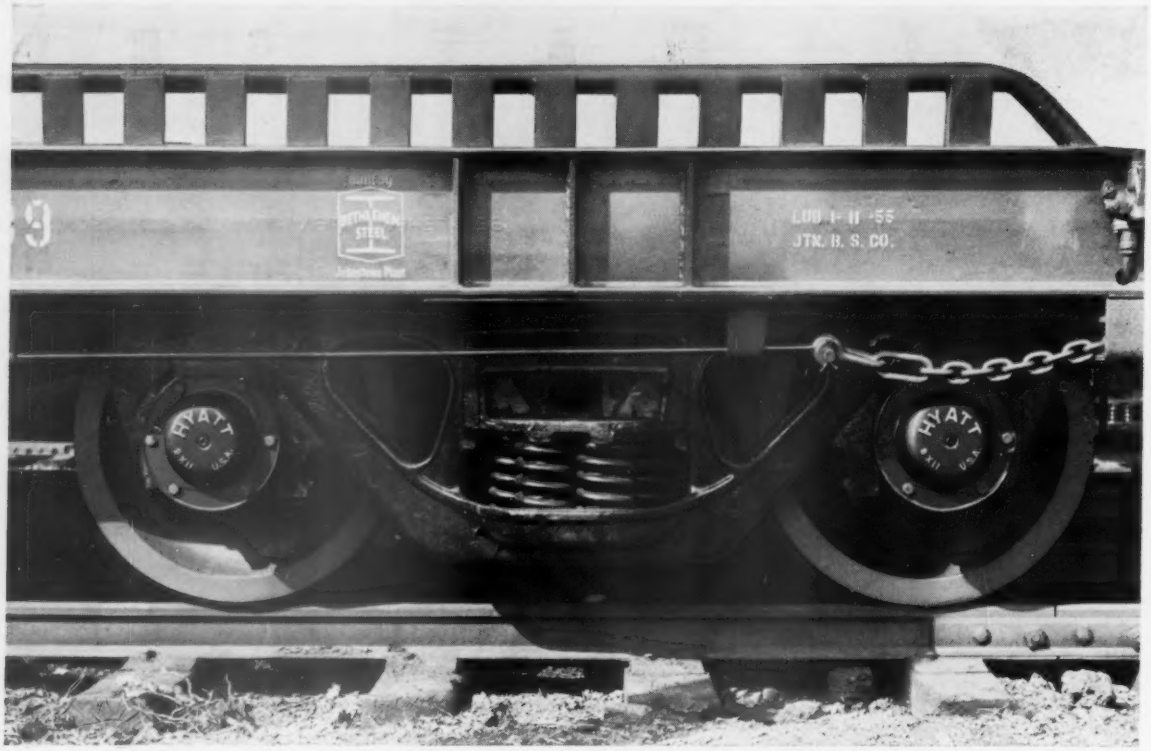
How the NYC steps up tempo of management. President Perlman describes the technique being used to provide new educational tools for officers and to set up a more effective organization. 46

SPECIAL REPORT: Mechanical Refrigeration

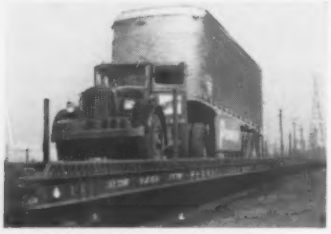
Mechanical cooling pays its way in moving frozen concentrates, 60% of which go by rail. 49

Perishable demands are exacting—Close temperature and humidity control is needed for frozen foods, fresh fruits and vegetables. 53

Mechanical controls are precise. Six systems for com-



Flatcars are equipped with high-speed trucks and HYATT Roller Bearing Journal Boxes.



Each specially equipped *75-foot* flatcar accommodates two loaded highway trailers.

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"Piggyback" freight, which promises substantial savings to motor common carriers and a vital new source of revenue to railroads, gathered more momentum with the recent inauguration of the Pennsylvania Railroad's "TrucTrain" service between America's two largest cities.

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HYATT ROLLER BEARING JOURNAL BOXES

RUNNING MATE OF FASTER FREIGHT

Current Statistics

Operating revenues, two months	
1955	$1,473,724,375
1954	1,466,007,085
Operating expenses, two months	
1955	$1,151,779,868
1954	1,209,001,363
Taxes, two months	
1955	$ 148,010,751
1954	141,143,814
Net railway operating income, two months	
1955	$ 134,444,567
1954	76,095,396
Net income, estimated, two months	
1955	$ 99,000,000
1954	44,000,000
Average price railroad stocks	
April 12, 1955	94.34
April 13, 1954	62.50
Carloadings, revenue freight	
Thirteen weeks, 1955	8,380,003
Thirteen weeks, 1954	7,962,439
Average daily freight car surplus	
Wk. ended April 9, 1955	23,254
Wk. ended April 10, 1954	139,136
Average daily freight car shortage	
Wk. ended April 9, 1955	2,142
Wk. ended April 10, 1954	211
Freight cars on order	
March 1, 1955	18,663
March 1, 1954	25,441
Freight cars delivered	
Two months, 1955	4,430
Two months, 1954	8,918
Average number railroad employees	
Mid-February 1955	1,008,740
Mid-February 1954	1,084,097

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Week at a Glance CONTINUED

plete automatic protection of perishables now available; more to come. Cost limits use to frozen foods. 56

"Fair play" for the railroads in the matter of navigational bridge clearances may result from a Department of Commerce study. 61

The "non-ops'" strike against the L&N and its affiliated roads was still in effect as this issue went to press, but freight service was gradually being restored in spite of it. 67

BRIEFS

Commuting by rail may be a thing of the past in northern New Jersey if the New York Central's application to drop passenger service on its West Shore division is approved, says Frank H. Simon, executive director of the Metropolitan Rapid Transit Commission. "I have been reliably informed," he said, that if the NYC request is granted "almost every other railroad in the area will petition for abandonment of their commuter services."

The Post Office Department may save $5,300,000 a year under a new air mail pay plan being developed with the 13 trunk airlines. The plan, needing only to have "technicalities" ironed out and approval by the Civil Aeronautics Board, is based on a new split of

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How to put highway miles on tracks!

The U. S. highway is a mighty busy place these days. In fact, the I. C. C. estimates that in 1953, motorists traveled about 500 billion miles on it to get from one city to another.

Obviously, many motorists drove these hazardous, tiring miles only because they needed a car at their destination. But you can put many of these highway miles on your tracks . . . and increase your passenger revenue with the Hertz Rail-Auto Travel Plan. This increasingly popular mode of travel offers Americans the speed and luxury of modern trains . . . plus the convenience of a clean, new Hertz car at their destination.

Last year alone, people who rented Hertz cars at their destination actually traveled more than 136 million miles on the railroads first. Now, you, as railroad management, can put even more highway miles on tracks by telling more people about the plan. Here are some simple ways you can help:

1 TRY the Hertz Rail-Auto Travel Plan yourself. See how courteous, convenient and economical Hertz service really is.

2 URGE your ticket agents to ask passengers this simple question: *"May I reserve a Hertz car for you at your destination?"* The agent who makes the reservation gets 10% commission on the total rental charge.

3 DISPLAY specially designed and attractively printed Hertz signs on the grill of your ticket agents' windows. The signs read, *"Reserve your Hertz car from your ticket agent,"* and are available, along with passenger Rail-Auto folders, at no charge to you.

4 MENTION the plan in your own advertising as an added inducement for persons to travel by rail. Use displays in your ticket offices. Advertise the plan in your timetable . . . on your billboards . . . on highway over-passes. This way, you will be taking advantage of the $1,000,000 Hertz spends every year in leading national magazines to advertise the Rail-Auto Travel Plan.

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Week at a Glance CONTINUED

payments to the airlines according to "in flight" and "terminal" costs.

Remember last week we reported, on this page, probable inauguration of truck-air-truck freight service for California fruits and vegetables to eastern cities. It began, all right. Only trouble was—the first plane, scheduled for New York, appears to have landed at Boston—which, if correct, must have spoiled Slick Airways' press conference on the new "service." (P.S.—Is it true that Slick rents a transport plane from the Navy at 25% of what Slick charges to rent its own planes to other users?)

Further progress in development of a coal-burning gas-turbine engine for railroad use was reported to the annual meeting of Bituminous Coal Research, Inc., at Pittsburgh last week, by John I. Yellott, director of research on the development project. Mr. Yellott was reported as stating that the engine would operate at a fuel cost substantially lower than that of a comparable diesel locomotive.

A definite campaign to eliminate all surplus facilities in order to reduce its New Jersey taxes—which are far higher than those assessed on railroad property by any other state—appears to be under way on the Pennsylvania. Latest step is removal of 3,614 ft of no-longer-needed track from Durant yard, North Elizabeth.

To demonstrate the end result of rough handling, the Bangor & Aroostook sent the chairmen of its enginemen's and trainmen's unions to a printing plant that was to use damaged rolls of newsprint. There they learned firsthand, from the pressroom foremen, what difficulties the damage caused—and heard that the printing company would try truck service unless the situation was corrected. As a result, says the railroad, "these chairmen have been continually stressing to their members the need for better handling."

Continuing reduction in loss and damage claims is reported by the Railway Express Agency for 1954 and the first two months of 1955. Number of claims in 1954 was 15.5% below 1953; in January 1955, 11.1% under January 1954; in February, 14.2% under February last year. Dollar payments and ratio of claims per 1,000 shipments are also down—thanks to an intensive prevention program.

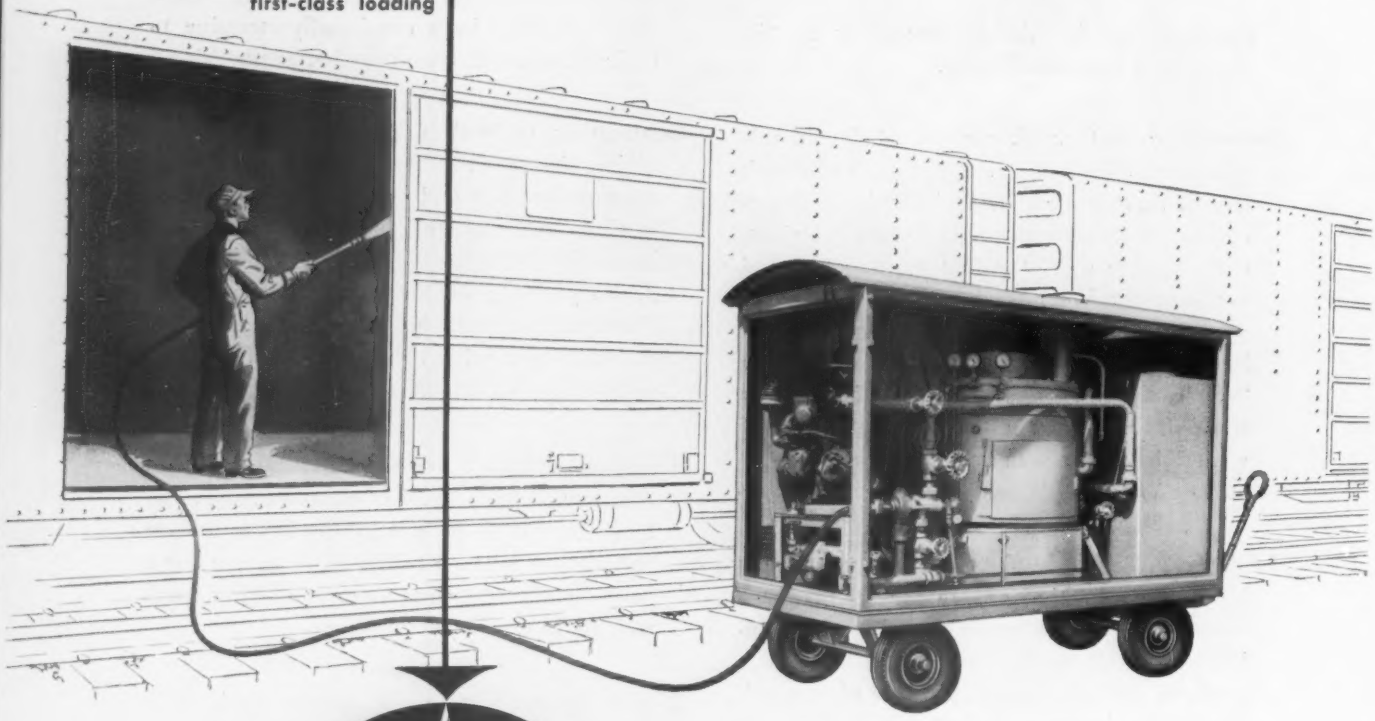
The report has been officially denied, but the rumor still persists that Pennsylvania truckers will drop their $250-million damage suit against Eastern railroads, in return for a railroad agreement not to oppose higher truck weights in the Keystone state.

Latest major system to become exclusively diesel powered is the Missouri Pacific; its last steam operation, in southern Illinois coal fields, ended April 7. The system will retain 43 steam locomotives at North Little Rock, Ark., for possible emergency use, although most remaining turntables, coal chutes, cinder dumps and water tanks will be removed or put to other uses. The road bought its first diesel-electric units in 1937 and now has 873 units.

Overwhelming approval of merger of the Nashville, Chattanooga & St. Louis into the parent Louisville & Nashville was expressed by L&N shareholders at their annual meeting in Louisville April 6. Over 98.6% of the stock represented either in person or by proxy voted for the merger; only about 2,500 out of more than 1,940,000 shares opposed it. Shareholders also authorized such increase in L&N capital stock as will be necessary to consummate the merger.

Now it Costs Less to keep your freight cars Earning More!

In 10 Minutes, one man can make an average box car acceptable for top-revenue first-class loading



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The UPGRADER SENIOR is a complete unit, including a 38 h.p. Vapor Steam Generator, all mounted on a compact base with weatherproof steel housing and furnished either skid-mounted or with easy-rolling wheels ready to go to work in any of these 4 ways:

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COLD RINSE CLEANING: Delivers 150 g.p.h. of cold water at 250 p.s.i. for use where heat or detergents cannot be tolerated.

STEAM: 1080 lbs. of steam per hour for any purpose including emergency building heating.

Are *you* spending too much to clean freight cars? A typical Vapor UPGRADER SENIOR at one location is saving nearly $500.00 per month. Its high-velocity stream of hot water searches out and cleans every surface, corner, and crevice — loosens and floods away every trace of dirt, residue, foreign matter, and odor-forming materials.

One man with an UPGRADER SENIOR will average 20 to 30 cars daily, instead of the customary 10 cars which four men can manually clean. Floor boards need not be removed, nor are detergents usually necessary except when heavy oil or grease is encountered.

Another cost-cutting use for the UPGRADER SENIOR is removal of ice from refrigerator cars in preparation for reloading. Savings here average around $5 a ton, and bunkers are thoroughly cleaned at the same time. It's excellent, too, for cleaning and degreasing car trucks, stripping paint, cleaning bridges and structures. If you would like to have complete information, ask for Bulletin 596.

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79 Roads Would Alter Per Diem

Group of short lines asks ICC to withdraw approval of Section 5a agreement unless changes are made in rental-fixing provisions

Seventy-nine railroads have filed a formal complaint asking the Interstate Commerce Commission to require changes in the rent-fixing provisions of the Section 5a agreement covering per diem. If this request is not granted, the complainants ask the commission to withdraw its approval of the agreement.

The pact was approved by the commission pursuant to the so-called Bulwinkle Act, which is now Section 5a of the Interstate Commerce Act. It is Section 5a Agreement No. 7, covering procedures for fixing demurrage and storage charges as well as car rentals.

The complainants are short lines, and their attorney is W. J. Hickey, who is also vice-president and general counsel of the American Short Line Railroad Association. Fifty of the complainants are subscribers to the per diem agreement.

The complaint asks the commission to find that "control of car rental rates and rules and regulations incident thereto by a very small number of railroads is contrary to the standards set forth in Section 5a, and not in furtherance of the national transportation policy." Another requested finding would stipulate that "control" of car rental rates and rules should be taken from the hands of the General Committee of the Operating-Transportation Division of the Association of American Railroads and placed "within a group or committee chosen by and representative of all railroads, large and small."

Allegations in the complaint include an assertion that the General Committee, "being composed of operating officials of high rank employed by the larger railroad interests, is not a body capable of objectively administering the authority conveyed in the agreement." Another allegation is that the General Committee functions through the AAR board of directors and that "the control by the board is not representative of the interests of a majority of rail carriers."

The agreement's rent-fixing procedures provide for a vote by subscribers on the basis of one vote for each car owned. The complaint says that more than half of all railroad-owned freight cars are owned by 12 railroads. It is also alleged that the AAR board in 1953 submitted a per-diem rate increase to letter ballot despite a General Committee recommendation that the matter be deferred.

"Failure of the agreement to afford adequate representation and voice to the vastly greater number of rail carriers who are required to pay rates subject to the control of a few major car-owning lines is contrary to the standards required to be met," the complaint also says. It goes on to assert that the per diem controversy now before the commission "discloses the necessity for a substantial change in the terms and conditions of the agreement."

The controversy referred to is that involved in the case wherein the commission has before it Examiner Howard Hosmer's proposed report recommending that the dispute be settled by a declaratory order stipulating that the car-rental charge would be on a reasonable basis if it were cut from $2.40 per day to $2.10. That case is No. 31358, instituted by the commission in 1953 after a group of roads had filed a complaint against lines refusing to pay the $2.40 charge. (*Railway Age*, December 13, 1954, page 7.)

RAILROAD MAN OF THE YEAR for 1954, C&O Train Porter John Edmonds, is greeted at the White House by President Eisenhower, as Mrs. Edmonds stands by. The ceremony preceded a luncheon at which the Federation for Railway Progress award was presented to Mr. Edmonds by Senator Bender of his home state, Ohio. The award, seventh made annually by the FRP since 1948, was based on Mr. Edmonds' courtesy and service to passengers on the C&O's Huntington division.

Law & Regulation

Order Giving Railroads Long Haul Edge Upheld

The U.S. Supreme Court has upheld a 1953 order of the Interstate Commerce Commission which set 75 miles as the point at which inherent advantages of oil tank truckers give way to those of railroads.

The case involved rate reductions by railroads carrying gasoline and light oils in parts of Colorado, Wyoming, South Dakota, Nebraska and Kansas to meet competition of tank trucks. The ICC first suspended, then approved, the reductions, but allowed them only on hauls of more than 75 miles.

The commission's report stated that this distance marked the point at which the railroads' inherent advantages became effective, whereas at shorter distances the reduced rates would be "a burden upon other traffic" (*Railway Age*, July 13, 1953, page 119).

Competing truckers appealed the ICC order in the U.S. District Court for Colorado and then to the Supreme Court. The truckers charged that the commission did not give due consideration to the effect of its order on the national transportation policy and acted on insufficient evidence from the railroads.

Broad Court Power in Venue Changes Upheld

The U.S. Supreme Court has reaffirmed a 1949 ruling so as to give district court judges broader discretion in permitting transfers of employe injury cases to courts more convenient to the parties.

In the case at issue, three dining car employes of the Atlantic Coast Line, injured in a derailment at Dillon, S.C., sued for damages in Philadelphia. The court there granted the road's motion to transfer the case to South Carolina.

The Supreme Court's determination amounted to a further development of its 1949 ruling in Ex Parte Collette. That ruling was that Section 1404 (a) of the revised U.S. Code modified section 6 of the Federal Employer's Liability Act which held that a railroad

could be sued in any district in which it was doing business.

In a five-to-three decision, the Supreme Court declared that the Court of Appeals for the third circuit, which upheld the district court in the transfer, had properly interpreted Section 1404 (a). The dissenting justices, however, held that the code revision should not be construed as changing the "plaintiff's choice of forum."

The high court had earlier denied the Dining Car Employes Union leave to file a brief in opposition to the transfer. The union contended that the plaintiffs, being Negroes, would be penalized by facing an all-white jury in the South.

Report Urges Cutting ICC Powers

Hoover Commission would transfer reparations awards, other "judicial functions," to courts—Would set up system of independent hearing examiners, new court

The "Hoover Commission" has recommended divesting the Interstate Commerce Commission of much of its judicial power and removing hearing examiners from the commission's jurisdiction.

The proposals are among 52 recommendations made by the Commission on Organization of the Executive Branch of the Government in its report to Congress on government legal services and procedure. The report is divided into sections on legal services, representation before agencies and legal procedure. Twenty of the proposals under the last section, dealing mainly with changes in the Administrative Procedures Act, did not get a majority vote of the commission but were forwarded to Congress "without commission action." The report is based in large measure on the findings of a task force headed by James Marsh Douglas, former chief justice of the Missouri Supreme Court.

New Court—As the key to its proposals affecting the ICC, the Hoover Commission advocates establishment of an "Administrative Court of the United States," which would be a trial court with jurisdiction in the field of trade regulation as well as in taxation and labor relations.

Underlying this proposal is the Hoover Commission's principle that, wherever possible, "there should be a complete separation of the judicial functions of administrative agencies from their other functions."

The Hoover Commission suggested that Congress "look into" transferring to the courts "certain judicial functions" of such agencies as the ICC. Where, however, such transfers cannot be imposed on existing courts, they would be assigned to the Administrative Court.

Money penalties and reparations or damages, as well as cease and desist orders, would thus be reserved as exclusively court functions. The Hoover Commission expressly recommended that the ICC and the Department of Agriculture be divested of authority to issue reparations orders.

Under the jurisdiction of this new court would be established an office of a chief hearing commissioner whose responsibility it would be to recruit and nominate hearing commissioners to fill the roles of hearing examiners now employed by the various agencies.

The Hoover Commission reported that its task force had reviewed the existing system for appointing hearing examiners and found it to be "wholly unsatisfactory." It recommended a system of nomination by the chief hearing commissioner subject to approval of an advisory committee. The hearing commissioners then would be "completely independent" of the agencies, but would preferably be assigned to particular agencies on "a continuing basis." Examiners now employed would have priority for appointments.

ICC Opposed—As reported in *Railway Age* October 25, 1954, page 10, however, the ICC opposes this plan. In a statement issued then by Commissioner Cross, the ICC said "examiners are not and cannot become independent judicial tribunals without changing in a very fundamental way the very nature of the administrative agencies as they now exist." The ICC employs about a third of the federal examiners.

Other recommendations included the following: Judicial review of agency action should be more in accordance with review of trial court proceedings; "courts should be authorized upon proof of irreparable damage to issue mandatory injunctions to agencies to proceed to a decision upon a showing of undue delay;" agency staffs should be separated to prevent consultation, at the time of adjudication of issues with staff members who prepared or investigated the case at hand; and an office of legal services and procedure should be set up in the Department of Justice to assist agencies in making uniform rules of procedure.

COLORADO NEWSMEN OPPOSE AIR - TRAVEL - AD EXCHANGE

Railroad men who may be prone to wonder if decades of pleading for transportation equality have fallen on a nation of completely deaf ears, may take some heart in this resolution unanimously passed at the recent annual meeting of the Colorado Press Association:

"Whereas, The Civil Aeronautics Board has agreed to allow local service or feeder air lines to exchange transportation for advertising in an amount up to $25,000 annually; and

"Whereas, A similar idea for certified trunk air lines was abandoned in 1940; and

"Whereas, The Interstate Commerce Commission specifically forbids railroads and buses to exchange transportation for advertising; and

"Whereas, Newspaper display space is offered to all advertisers on an equal basis in exchange only for legal tender,

"Now, therefore, be it resolved . . . That the Civil Aeronautics Board be requested by this resolution to rescind its permitting exchange of transportation for advertising and that copies of this resolution be fowarded to Colorado's Congressional delegation as a suggestion that the entire national transportation policy be revised to equalize regulations governing all forms of transportation."

Rates and Fares

Eastern Roads File Tariff To End Dual Rate Systems

Eastern railroads have filed with the Interstate Commerce Commission a tariff embodying a "major step" in their plan to eliminate from their territory the dual system of class rates.

The tariff is Agent Boin's E-180, ICC A-1059, filed April 1 with a June 1 effective date. E. V. Hill, chairman of the Traffic Executive Association—Eastern Railroads, explained that the 60 days' notice was given so interested parties would have time to "carefully examine the tariff and bring any errors discovered to the attention of the railroads."

Simplification — The filing was hailed by a spokesman for the Rail-

JUDGES FOR MONON-RAILWAY AGE ESSAY CONTEST

Watch for announcement of the winners of the Monon-*Railway Age* Essay Contest on the subject: "Traditional Differentials in Railroad Rates," which closed March 31. A total of 38 entries were received—a large number, considering the complexity of the subject.

Judges for the contest are: Richard F. Mitchell, chairman, Interstate Commerce Commission; Warren W. Brown, president, Monon; and J. R. Staley, vice-president, Quaker Oats Company.

roads' Tariff Research Group as "concrete evidence in the most tangible and useful form of real progress in effecting tariff simplification."

Mr. Hill pointed out that the new tariff will supersede 55 class rate and exceptions tariffs, except with respect to a few commodities and except on coastwise, intercoastal, export and import traffic. The old tariffs have remained in effect to take care of traffic subject to classifications, the dual system of rates having come about with publication of the 13 tariffs carrying class rates prescribed by the commission in the No. 28300 case.

Revolutionary New Rates in Britain

Railroads ask okay for maximum charges for all freight based on density and volume—Value and classification removed from consideration—Would provide ceiling

A major step toward the freedom in rate-making which was promised them by the Transport Act of 1953 was taken by the government owned British railways on March 21.

On that date, the British Transport Commission, in which the nationalized railways are vested, submitted to the Transport Tribunal a plan of maximum rates for all freight traffic which is based upon what may be termed revolutionary new principles of railway rate-making. If approved by the Tribunal, these rates would form the lawful "ceiling" in charges, under which BTC could make reductions to individual shippers or for individual commodities and hauls. Thus, the maximum rates would not constitute either the rate level or rate "standards," but only the upper limit of charges.

Presumably, freight moving in sufficient volume or consistency to make possible lower costs to the railways would be carried at rates below those in the maximum charges scheme. To quote an "informatory memorandum" accompanying the application, the new rate plan will "settle the maximum charges which the BTC may make." Actual charges will be "left to the commission's [i.e., railways'] discretion, which will be exercised commercially."

The most significant aspect of the new maximum rate scales is that they abolish entirely any consideration of "value" or "ability to pay," and do away with the classification of commodities by classes, which is an integral part of traditional railway rate-making in Britain and the United States.

"Load ability"—In place of these factors, the new rate scheme takes account of (1) volume and (2) "loadability." Loadability is actually an attempt to take into account the relative density of the freight offered, and to reflect the fact that the more of any particular commodity that can be contained on one car, the cheaper it is to carry it, per ton. "Loadability" is defined in the rate application as "the greatest weight of goods identical in every way (save as to total weight) with the goods comprised in the consignment as tendered for carriage, which is reasonably capable of being loaded and safely carried in an open railway wagon with two axles capable of carrying a maximum load of 10 tons and with a cubic capacity of 450 cu ft."

The maximum rate plan is simplicity itself. It is embodied in a series of scales—one referring to the weight of the shipment and the other to its "loadability." Basic charge for the first 10 miles (which includes terminal services, but not store-door pick-up and delivery) ranges from 28 shillings ($3.92) a ton for a 10-ton load of a commodity which loads up to 10 tons per car, to 160 shillings ($22.40) per ton for commodities which load between one and two tons. Charges for mileage over 10 miles are graduated from 3¼ pence (3.8 cents) to 1 shilling, 3 pence (17½ cents) per ton, per mile—again according to load and loadability. In summary the scales appear thus:

Weight	Loadability	First 10 Miles	Per Mile beyond
Tons	Tons	Per Ton	Per Ton
10 or more	10	28s	3¼d
8 to 10	8 to 10	31s	3½d
6 to 8	6 to 8	39s	4d
4 to 6	4 to 6	54s	5½d
3 to 4	3 to 4	72s	7d
2 to 3	2 to 3	100s	9d
1 to 2	..	160s	1s 3d

Rate scales of this nature accomplish two ends:

(1) They encourage shipment of a size of a carload or more (as do the differences between carload and less-carload rates or ratings in the U.S.); and

(2) They provide a higher car "load" and a lower rate per ton for the denser commodities, of which more can be loaded on a single car.

Distance will be based upon the "shortest working railway route."

Reason for Change—When British railways were unified and placed in government ownership and operation at the end of World War II, certain trucking and inland waterway operations also were taken over. The idea was to divide traffic among the forms of transport under one ownership, on the basis of relative cost and service. This national transport net was protected from carrier competition by prohibition of intercity trucking for hire beyond a limit of 25 miles from operating headquarters.

But the Labor government was unsuccessful in getting restrictions placed on trucking performed by shippers for their own freight, and private trucking flourished at the expense of the socialized carriers. With the Conservative government there came the Transport Act of 1953, which provided for sale of some of the assets and rights of the nationalized trucking business, and promised to restore the right of other truckers to compete for intercity traffic, effective January 1, 1955. At the same time, the still-nationalized railways were to be decentralized and given freedom to make rates on a commercial (i.e.,

RAIL LAYING on the Erie near Elmira, N.Y., is being carried out with a rail-mounted Caterpillar D6 tractor and Hystaway attachment. Addition of nine shop-made shoes to each crawler track enables the machine to operate along the rails. During one working period of 2 hr 36 min, the unit was able to lay 5,380 ft of 130-lb rail. No difficulty has been experienced in passing over switches and frogs with the outfit.

a completely competitive and individual) basis.

Prior to the Act of 1953, British railways were, by law, required to adhere in general to a pricing structure which classified commodities according to value. This kind of pricing, according to the BTC's "informatory memo," "ignores the substantial variations in relative cost arising from differences in particular operating circumstances. To succeed it needs conditions of near monopoly, which no longer exist."

Now that trucks are free to compete, without rate regulation of any kind, the present rate-making principles of British railways must be abandoned. The BTC memo notes that railway costs are governed by a variety of conditions, such as (1) weight and loading characteristics; (2) volume and regularity of traffic; and (3) volume and balance of traffic over any particular route. It argues that, under competition, railway rates for any particular haul must reflect these differences in cost.

"The new maxima have been put at a level high enough to cover a substantial range of variation in the charges to be made in practice. The new maxima do not reflect the extremes of cost." The memo adds that the new rate plan has no connection, either, with increases designed to meet increased costs from inflation. It is, rather, a "yardstick."

A chief effect of the new rate scheme, if accepted, will be to relieve British railways of remaining statutory obligations with regard to their freight charges. Its practical effect will be not an immediate shift of rates to the maximum levels set forth in the scheme, but to enable the British Transport Commission to start a review of all existing rates. The adjustment, according to the Railway Gazette, "may be upwards or downwards, as business principles dictate, but representative bodies of traders [shippers] will be consulted as the process is carried out."

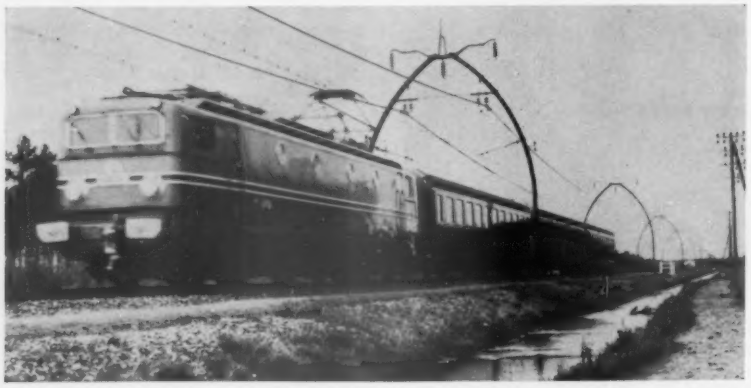
Overseas

207 Miles an Hour!

French tests with high-speed electric locomotives develop new information on tracking and train resistance, and indicate that guiding trucks are not essential

Last year, on February 21, 1954, an electric locomotive of the French National Railroads, the CC 7121, running between Dijon and Beaune, broke the world's rail speed record by reaching 151.6 mph. This locomotive, pulling three passenger cars, was one of a series of 60 locomotives built since 1949.

AIRPLANE VIEW of Locomotive BB 9004 as it broke the world's rail speed record by reaching 207 mph.



LOCOMOTIVE CC 7107 nears the end of the speed test run in which it reached 198 mph.

On March 28 and 29, 1955, the French Railroads broke their own record with two electric locomotives, the CC 7107, another in the same series as the 1954 record breaker, and the BB 9004. For the test runs, both these locomotives pulled the same three passenger cars, weighing 111 tons. The CC 7107 reached 198 mph, and the BB 9004 set the mark of 207 mph.

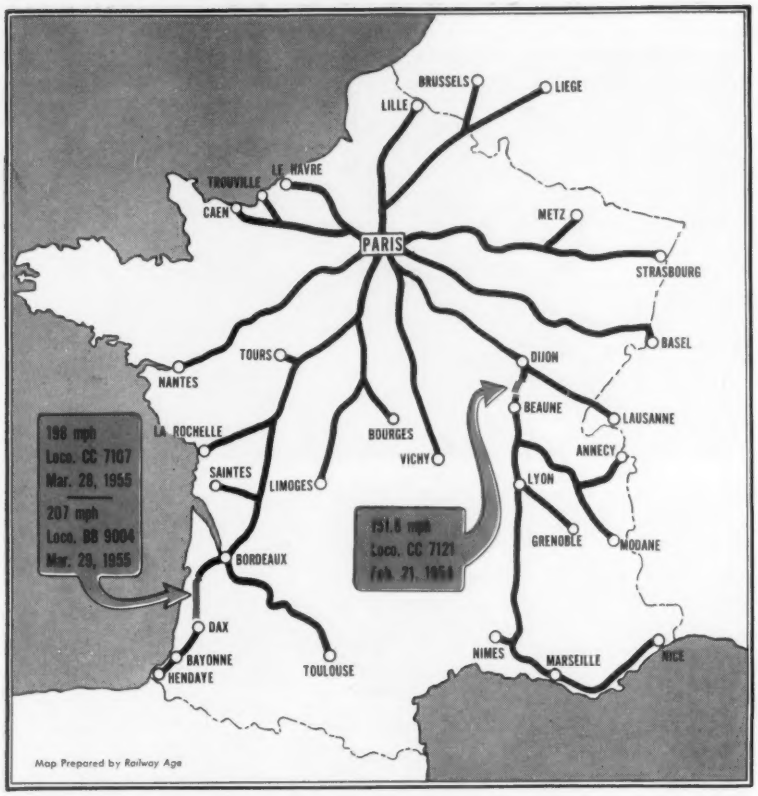
Tests were held on a 40-mile section of straight track in southwest France between Bordeaux and Dax, where a 1,500-volt, d-c system of electrification has been in operation since 1927. It was felt that the 40-mi stretch would allow sufficient distance for acceleration to high speed and braking, a special problem for high-speed runs, since applying brakes while traveling more than 125 mph was not considered safe. Special brakes had not been designed for the tests, and technicians decided that the windows would have to be lowered at the proper moment to create a drag. This system was used during the actual runs, and trains were successfully slowed down to safe braking speed.

Passengers in the high-speed trains reported that their ride was smooth and comfortable. At top speed gravel from the track bed flew up as high as the windows.

Both locomotives used in the tests have been in regular service. The CC 7107, an entirely French-built locomotive manufactured by the Societe Alsthom, has two six-wheel trucks, weighs 107 tons, and is of the type which regularly makes the Paris-Lyon run of the "Mistral" at an average of 76 mph.

Put in service in 1953, the BB 9004 is the result of group cooperation between Creusot, Schneider-Westinghouse and Jeumont. It has two four-wheel trucks, weighs about 83 tons, and has about 300 hp less than the CC 7107. The BB 9004 is a prototype of the latest locomotive design developed by the French to serve its 1,500-volt, d-c lines for high-speed runs. Forty locomotives of this type are under construction.

Since the lighter BB 9004 costs about



LOCATION AND RESULTS of the French Railroads' 1954 and 1955 speed tests.

25% less than the CC 7000 series, the French were eager to discover if its performance would compare favorably with the successful CC 7000's.

To adapt the transmissions to the high speeds, slight modifications were made in the gears of the two locomotives, and solid wheels were used to avoid effects of centrifugal force and braking on tired wheels. It was estimated that the locomotives would develop about 10,000 hp at 185 mph, and a special pantograph was designed to collect 4,000 amp at high speed. An aviation wind tunnel was taken over to allow examination of how a 185-mile wind would affect pressure of the pantograph on the catenary. Elaborate safety measures were taken, including complete shop tests of all moving parts, which were made to revolve at a speed simulating 260 mph in actual operation.

The three passenger cars attached to each locomotive for the speed tests were virtually unchanged. However, it was necessary to remove all seats from the first car to accommodate instruments and equipment used to measure the effects of speed on all parts of the train and track. The test train carried a piezo-electric quartz accelerometer to test stability and lateral strain, registered on cathodic oscillographs, various precision instruments to measure speed, time, and line voltage, plus, as a final touch, a periscope through which engineers could watch to see that the pantograph was in constant contact with the catenary. The rear of the last passenger car was especially streamlined to assure the best possible air flow.

The CC 7107 was tested March 28 and the BB 9004 March 29. After 13 miles, the CC 7107 was running at 180 mph, and was allowed to reach 198 mph. The BB 9004 accelerated at about the same rate, but climbed to 207 mph. Soon after the BB 9004 reached record speed, trouble developed in its rear pantograph, a result of heat created by high speed. The front pantograph was raised, and the rear one lowered, while the train was traveling at 198 mph. Although the CC 7107 apparently did not affect the rail, a standard French track unaltered for the tests, it was found that the BB 9004's top speed of 207 miles caused slight damage. A principal reason for conducting the tests was to determine if guiding trucks are necessary for high speeds, and results indicate they are not. Both locomotives developed 12,000 hp at top speeds.

Remote Control — On April 13, electric locomotive BB 9003, twin of the unit that set the speed record, pulled three empty passenger cars and a laboratory car for 11 miles at a top speed of about 80 mph, with no one aboard the train. Engineers along the track beamed radio impulses to a 20-lb control box in the locomotive cab. The experiment at remote control was considered a complete success.

Organizations

Gurley, DeButts to Speak At U.S. Chamber's Meeting

Fred Gurley, president of the Santa Fe, and Harry A. DeButts, president of the Southern, will be speakers at the forty-third annual meeting of the Chamber of Commerce of the United States, which will be held in Washington, D.C., from May 1 through May 4.

Mr. Gurley will address May 3's general session, speaking on "Right to Work." Mr. DeButts will address the "Distribution and Manufacture" luncheon session on the same day, discussing "Community Action to Provide More Jobs."

Other proceedings of the meeting will include a "Transportation" luncheon session, also on May 3. The speaker there will be John Jay Hopkins, president and chairman of the board, General Dynamics Corporation, whose subject will be "Atomic Power Potential Transportation."

The **Communications Section** of the **Association of American Railroads** will hold its annual meeting in San Francisco, May 17-19. Business sessions, the annual dinner and the display of exhibits all will be at the Hotel St. Francis—a change in the original plan to have the exhibit at the Hotel Sir Francis Drake.

E. Frederic Uhrbrock, security analyst for the New York Stock Exchange firm of Vilas & Hickey, will be the

RAILROADS WOULD KEEP EX PARTE 175 INCREASES

The railroads' petition for authority to make permanent the Ex Parte 175 increases in freight rates was expected to be filed with the Interstate Commerce Commission by the end of last week. The increases are now approved for temporary application only, the prescribed expiration date being December 31.

Definitely due at the commission last week, on April 15, was the railroads' reply to the recent petition wherein the National Coal Association has asked that the Ex Parte 175 increases on bituminous coal be removed at this time *(Railway Age*, March 28, page 11). A commission order of March 31 fixed this April 15 deadline for the filing of replies to the coal group's plea.

It was understood that the railroad reply would ask that the petition be denied. Arguments in support of that request were expected to include a contention that issues raised by the Coal Association were "rate case" issues which should not be dealt with in a "revenue case" like Ex Parte 175.

principal speaker at the annual luncheon meeting of the **Central Maryland Enterprise Council** of the **Transportation Association of America** at the Emerson Hotel, Baltimore, at 12:15 p.m., April 21. He will discuss steps that can be taken in Washington, by Congressional action and executive order "to build a healthier transportation system under private ownership." Harold F. Hammond, executive vice-president of the TAA, will comment, at the meeting, on the association's legislative program and on the recently released "Hoover commission" report on government traffic management (*Railway Age*, April 4, page 46).

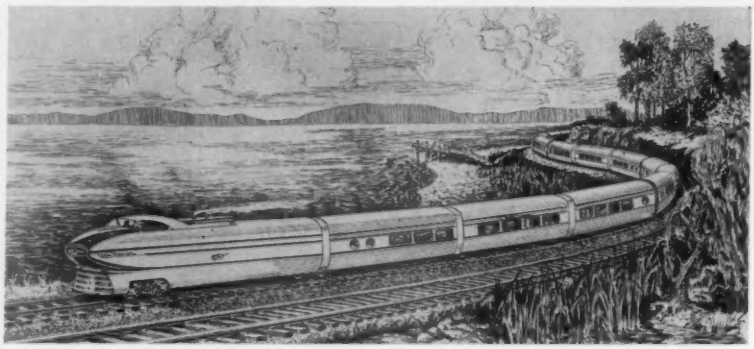
The 26th annual meeting of the **Association of Interstate Commerce Commission Practitioners** will be held at the Hotel Commodore, New York, May 5-6, in cooperation with the **Metropolitan New York Chapter.** The program for the first day includes a forum discussion on revision of rules of practice, and on procedure of the ICC. Commissioner Kenneth H. Tuggle will speak at luncheon on the subject, "Are Our National Transportation Policy and Laws Outmoded?" Three sectional groups will discuss matters of finance, traffic and operations on the second day. A dinner and dance at 7:30 p.m., at the Hotel Biltmore, will conclude the meeting.

Five Interstate Commerce Commissioners—Hugh W. Cross, Anthony F. Arpaia, Howard G. Freas, Kenneth H. Tuggle and Everett Hutchinson—will speak on "The ICC—Its Organization and Work," at the April 21 dinner meeting of the **New York Railroad Club.** The meeting, at 8:15 p.m., at the Hotel Commodore, will be preceded by a dinner starting at 7 p.m.

"Assembly Line Maintenance," a film showing how the Southern is running a completely mechanized gang for tie renewals, track raising and ballasting, will be shown at the April 28 meeting of the **Metropolitan Maintenance of Way Club.** H. C. Fox, process engineer of the Southern, will be narrator and will answer questions. The meeting will be held at the Railroad-Machinery Club, New York, at 8:30 p.m., preceded by a dinner at 6:30 p.m.

Frank H. Simon, executive director of the Metropolitan Rapid Transit Commission, will discuss the transportation situation of the city of New York at a meeting of **Railroad Enthusiasts, New York Division,** at 8 p.m., April 22, in the YMCA Auditorium, Pennsylvania Station.

Chicago's future as a seaport, as the result of the St. Lawrence seaway, the Calumet-Sag waterway improvement program (*Railway Age* March 7, page 44) and other internal port improvements, will be the topic discussed by Maxim M. Cohen, general manager-secretary of the Chicago Regional Port District, as guest speaker at the **Mid-West Shippers Advisory Board**



LIGHTWEIGHT TRAINS FOR THE NEW HAVEN AND NEW YORK CENTRAL

LIGHTWEIGHT TRAINS RECENTLY ORDERED by the New York Central and the New Haven are shown here in artists' conceptions. Two trains like the upper one will be built by the Pullman-Standard Car Manufacturing Company, one for the NH and one for the NYC, while the "Talgo" train below will be built by ACF Industries for the NH (*Railway Age*, April 4, page 8).

Motive power for the Pullman-Standard trains will be supplied by the Baldwin-Lima-Hamilton Corporation; for the ACF train by General Motors Corporation. The New Haven trains will have locomotives at each end, permitting them to operate in either direction without having to turn around.

The Pullman-Standard trains, to be built of aluminum, will consist of a single center car (with axles at either end), and four semi-permanently coupled single-axle units of two cars each. One car in each of the four two-car units will be 50½ ft long, to house an entrance vestibule and toilet facilities, while the other cars will be 48 ft long. Each 48-ft car, except the center car, will seat 48 passengers. The center car, because of wheel wells at either end, will seat only 40 passengers, as will the entrance cars. Center of gravity of the cars will be 13 in. lower than the 55 in. of conventional cars, and each car will have an inside headroom of eight ft. The floor of the cars will be only 23 in. above the rails.

Approximately one-third as heavy as conventional equipment, each car will have its own air-conditioning unit, with power for the electrical system obtainable from auxiliary power in the locomotive. The auxiliary power will be supplemented by oil-fired units in each car, and will provide electrical heat in winter. Panel-type heating in car sides will supplement overhead ducts. Overhead fluorescent lights will fit in flush translucent ducts in the ceiling.

The "Talgo" train for the NH will weigh less than half as much as the average streamline train of today. The center of gravity will be two ft lower than conventional trains. More than 400 passengers will be accommodated. Demonstrator "Talgo" units made a New Haven-Boston test run last year (*Railway Age*, July 5, 1954, page 9).

Patrick B. McGinnis, president of the New Haven, has said that he is interested in acquiring for that road a total of 30 lightweight trains, similar to those pictured here, and that, when such trains go into service, he "wants to cut passenger fares from 3.375 cents per mile to a flat rate of two cents per mile."

meeting April 21. Mr. Cohen will speak at a luncheon session to be held jointly with the **Traffic Club of Chicago.** Accomplishments of the April Perfect Shipping Campaign will be described by J. G. Borson, general traffic manager of Hotpoint, Inc., and chairman of the Freight Loss and Damage Prevention Committee. P. G. Jefferson, general traffic manager of Fairbanks, Morse & Co. and general chairman of the board, will preside at the general session.

Figures of the Week

February's Net Up 100 Per Cent

Estimate of $46 million doubles $23 million of last year—Net operating income was $66.6 million, up $22.5 million

Estimated net income for Class I railroads in February, after interest and rentals, was $46 million, just double the $23 million reported for the same month in 1954.

The monthly statement of the Bureau of Railway Economics, Association of American Railroads, also showed net railway operating income, before interest and rentals, at $66,604,264 compared with $44,073,594 in February 1954.

In the 12 months ended February 28, 1955, the rate of return averaged 3.49% compared with 3.88% for the 12 months ended February 28, 1954. The AAR reported that, due to labor difficulties, four railroads in the Southern region were unable to file returns for February. Comparisons in the report, therefore, are exclusive of returns for those four roads for the months of January and February in both 1954 and 1955.

Net income for the first two months, after interest and rentals, was estimated at $99 million compared with $44 million for the corresponding period in 1954. Net railway operating income, before interest and rentals, for January-February 1955 was $134,444,567 and $76,095,396 for the same period, 1954.

Gross in February 1955 was put at $724,335,469 and was $719,367,083 in February 1954. Gross for the first two months of 1955 amounted to $1,473,724,375 compared with $1,466,007,085 for January-February 1954, an increase of 0.5%. Operating expenses came to $1,151,779,868 compared with $1,209,001,363, a decrease of 4.7%.

Twenty-two Class I roads failed to earn interest and rentals in the first two months of 1955, of which 11 were in the Eastern district, four in the Southern region, and seven in the Western district.

CLASS I RAILROADS—UNITED STATES

	Month of February	
	1955	*1954*
Total operating revenues	$ 724,335,469	$ 719,367,083
Total operating expenses	564,101,448	584,592,156
Operating ratio—per cent	77.88	81.26
Taxes	73,783,955	69,979,156
Net railway operating income (Earnings before charges)	66,604,264	44,073,594
Net income, after charges (estimated)	46,000,000	23,000,000
	Two Months Ended February 28	
Total operating revenues	$1,473,724,375	$1,466,007,085
Total operating expenses	1,151,779,868	1,209,001,363
Operating ratio—per cent	78.15	82.47
Taxes	148,010,751	141,143,814
Net railway operating income (Earnings before charges)	134,444,567	76,095,396
Net income, after charges (estimated)	99,000,000	44,000,000

Freight Car Loadings

Loadings of revenue freight in the week ended April 9 totaled 663,462 cars, the Association of American Railroads announced on April 14. This was an increase of 4,403 cars, or 0.7%, compared with the previous week; an increase of 56,672 cars, or 9.3%, compared with the corresponding week last year; and a decrease of 57,677 cars, or 8.0%, compared with the equivalent 1953 week.

Loadings of revenue freight for the week ended April 2 totaled 659,059 cars; the summary, compiled by the Car Service Division, AAR, follows:

REVENUE FREIGHT CAR LOADINGS
For the week ended Saturday, April 2

District	1955	1954	1953
Eastern	121,975	107,638	125,825
Allegheny	134,003	113,582	130,334
Pocahontas	50,979	39,874	46,073
Southern	108,429	116,585	132,283
Northwestern	74,177	67,072	99,874
Central Western	112,772	100,059	110,997
Southwestern	56,724	54,492	59,131
Total Western Districts	243,673	221,623	270,002
Total All Roads	659,059	599,302	704,517
Commodities:			
Grain and grain products	41,373	40,110	41,376
Livestock	7,091	7,529	7,034
Coal	104,677	87,438	96,393
Coke	10,685	7,951	13,416
Forest products	41,699	38,720	45,423
Ore	17,448	14,588	44,999
Merchandise l.c.l.	62,269	64,591	71,458
Miscellaneous	373,817	338,375	384,418
April 2	659,059	599,302	704,517
March 26	639,447	601,414	715,333
March 19	656,117	609,959	701,065
March 12	666,548	609,937	700,183
March 5	658,975	590,576	684,864
Cumulative total, 13 weeks	8,380,003	7,962,439	9,024,347

Equipment & Supplies

FREIGHT CARS

New Freight-Car Cushioning Device Being Tested on SP

A new freight-car cushioning device, developed by the Southern Pacific in cooperation with the Stanford Research Institute, is being tested by the railroad, D. J. Russell, SP president, announced last week. Mr. Russell said the device, on which the SP is seeking patents, shows considerable promise, but that research and development will continue for possible refinements in design to make the device more suitable for volume production.

The device consists essentially of a friction brake actuated by a hydraulic mechanism built into a modified freight car underframe to cushion the shock when cars are coupled. Couplers are attached to a car-length sill "floating" inside the fixed car underframe. Movements of this sill are slowed by the braking action of the hydrafriction unit, which is automatically in direct proportion to the force on either coupler. Adjustment between impact and cushioning reaction is said to be instantaneous.

Mr. Russell said the new device was first built and tested as a pilot model, then improved and built full size into a freight car constructed at the SP's Sacramento, Cal., shops. The prototype car is now in test service. Its performance, under various operating conditions is being checked by the road's department of research and mechanical standards as well as by representatives of its freight protection, merchandise and station service. Because the new device makes use of a special design underframe, the SP chief executive pointed out, it cannot be applied to old cars, but if it proves successful it will be built into more of the cars continually being built at Sacramento.

The recent **Chesapeake & Ohio** order for 500 specially equipped box cars (*Railway Age*, April 11, page 63), was divided equally between ACF Industries and the Pullman-Standard Car Manufacturing Company. Our report last week erroneously said the entire lot was ordered from the latter manufacturer.

The **Erie** has been authorized by its directors to purchase immediately 500 50-ft box cars for delivery in the third quarter of this year at an estimated cost of $4,500,000. The order will include 200 cars to be specially equipped with damage-free devices for handling automobile parts and other freight.

The **Lackawanna** will convert 84 additional hopper cars into flat cars for piggyback service, at a cost of $420,000. Work will be done at the road's Keyser Valley shops, Scranton, Pa.

The **Louisville & Nashville** has

ordered 200 50-ton pulpwood cars from ACF Industries at an estimated cost of $1,100,000. Delivery is expected in July.

The **North American Car Corporation** has ordered 55 70-ton covered hopper cars from the Pullman-Standard Car Manufacturing Company at an estimated unit cost of $7,600. Delivery is scheduled for May.

The **Rock Island** has ordered 100 70-ton covered hopper cars from the Pullman-Standard Car Manufacturing Company at a unit cost of $7,350. Delivery is scheduled for April and May.

The **Texas & Pacific** has been authorized by its directors to prepare for a 200-car construction program at its Marshall, Tex., shops in 1956. The new order will include 150 50-ton box cars and 50 50-ton steel flat cars.

The **Western Maryland** has ordered 50 50-ton box cars from the General American Transportation Corporation at an estimated cost of $425,000. Delivery is scheduled for June.

MARINE

The **Erie** has been authorized by its directors to purchase five steel barges, for use in New York Harbor, at an estimated cost of $213,000.

Financial

New Group Wins B&M Control

Management loses proxy fight — Nineteen new directors elected — French, Sughrue, resign

Control of the Boston Maine passed from its former management to a new board of 19 directors at the road's annual meeting, which began in Boston April 13 and was adjourned about 1 a.m., April 14. The new board—generally described as "friends and business associates" of New Haven President Patrick B. McGinnis—is reported to have polled votes of 273,237 shares of preferred and common stock, against 197,142 shares voted for the former management, although some of the votes cast by proxy were still subject to contest as this issue of *Railway Age* went to press.

The new directors, whose names and business connections were reported in *Railway Age* March 28, page 16, went into session immediately after adjournment of the stockholders' meeting, and shortly thereafter announced the railroad's new executive committee. This consists of Arthur P. Wilcox, Rockland, Mass., chairman pro tem; Herbert Alpert, Brookline, Mass., Burton M. Cross, Augusta, Me.; Russell B. Valentine, Atlantic Highlands, N. J.; James A. Walsh, Greenwich, Conn.; and Pierre Dumaine, Wayland, Mass. Mr. Cross is a former governor of Maine, and Mr. Dumaine is a brother of Frederic C. Dumaine, Jr., former president of the New Haven, who was ousted from that position by Mr. McGuinnis in another proxy fight last year.

Mr. Alpert also was elected vice-president and general counsel of the B&M, while James J. Doyle, New York attorney, was elected assistant general counsel.

McGinnis to be President?—The new executive committee, in a statement issued April 14, said that, "in accordance with proxy material," the new directors "will immediately seek full legal approval from appropriate governmental agencies for election of Patrick B. McGinnis as a director and president of the Boston & Maine." Interstate Commerce Commission approval of his election would be required, as the Interstate Commerce Act makes it "unlawful for any person to hold the position of officer or director of more than one carrier, unless such holding shall have been authorized by order of the commission."

Relations between the B&M and the NH are the subject of an ICC inquiry which began in Boston last week, but which was recessed during the B&M's annual meeting, so as not to influence the outcome of that meeting.

French, Sughrue, Resign—E. S. French, former chairman, T. G. Sughrue, former president, and W. J. Burns, corporation clerk, of the B&M, resigned from those positions just prior to the meeting, reportedly as a "technical move" to protect their pension rights. The new executive committee, in the same statement quoted above, said it "will give careful and considered thought to the filling of the vacancies caused by the resignations."

The statement added that the new directors "fully appreciate the responsibility entrusted to them"; and "have great confidence in New England's future." It pledged their "every effort" to make the B&M "one of the finest railroads in the country," and "wholehearted cooperation with all New England officials toward increased industrial development of the area, with special emphasis on building up the port of Boston and its activities."

Employees were assured that "no changes will be made."

In a statement issued just prior to adjournment of the meeting, Mr. Sughrue thanked directors, stockholders and employees, for their "loyal support and cooperation"; asked that they extend the same cooperation to the road's new officers; and said he "bore no illwill" as a result of the proxy fight.

The meeting itself was held on schedule, after legal efforts to force its postponement had failed. It was presided over by Laurence F. Whittemore, former president of the NH, and, prior to the meeting, a director of the B&M.

South Shore Management Wins Third Proxy Fight

Management of the Chicago South Shore & South Bend has won its third proxy battle with William Henning Rubin, Chicago hotel owner seeking control of the road (*Railway Age*, March 28, page 42), by almost the same margin by which it defeated him in 1954.

The slate of nine directors representing South Shore management was re-elected at the road's April 1 annual meeting by a vote of 218,657 to 44,155. Mr. Rubin's nominees polled 44,043 votes in a similar battle in 1954. In 1953, his slate of directors polled votes of 87,035 shares.

Mr. Rubin has sought to install cumulative voting for directors, to compel issuance of monthly earnings statements, and to restrict management's expenditures for proxy solicitation. Previously he sought to have South Shore stock listed on an exchange. He also sought to eliminate from the road's charter a provision requiring a majority of the directors to be Indiana residents, although Indiana statutes under which the road is incorporated require such a board composition.

Court Names MoPac Reorganization Managers

Approval of five reorganization managers who will be responsible for placing in effect the so-called "agreed" system reorganization plan for the Missouri Pacific, was given by Federal Judge George H. Moore in St. Louis April 8. Initially the group will select legal counsel and proceed with drafting mortgages and charter amendments, preparing new security issues, etc., as a possible prelude to ending the MoPac's 22-year bankruptcy (*Railway Age*, March 7, page 48).

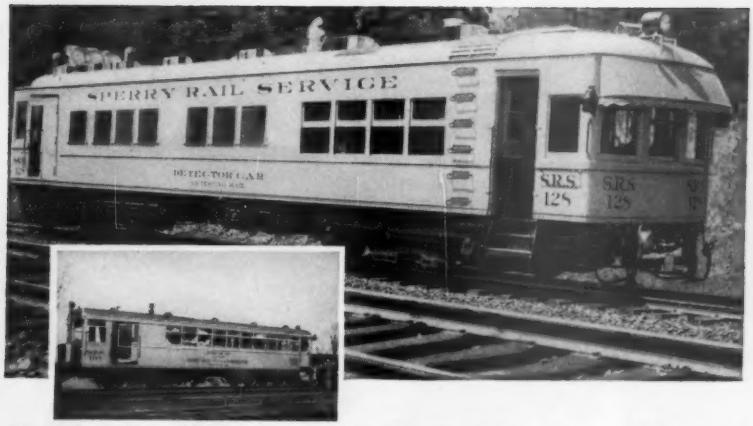
Judge Moore "subordinated personal feelings" in his approval of Col. T. C. Davis, chairman of the MP debtor board, as one of the reorganization managers. The judge recalled full-page newspaper advertisements in which Mr. Davis, Robert R. Young, then chairman of Alleghany Corporation, and Allan Kirby, Alleghany president, attacked the previous reorganization plan, Judge Moore and Trustee Guy A. Thompson.

Other managers named were: A.

(*Continued on page 67*)

ERIE

IMPROVES TRACK SAFETY CONSISTENTLY SINCE 1929 with SPERRY RAIL SERVICE



"It took us three days to cover the first 22 miles due to various difficulties with the early equipment," Mr. Blowers recalls. "However, Sperry's capable crew made repairs in the field and kept the inspection going with excellent results. Of the rails they thought contained hidden defects, a very high percentage proved defective on breaking." Constant development over the years has resulted in a modern fleet of 17 cars whose performance is unbelievably superior to the Detector Car (inset) which first served the Erie.

"I was Division Engineer back in 1929 when we scheduled our first test with Sperry Rail Service," states Mr. B. Blowers, Chief Engineer, Erie Railroad Company. "The Detector Car we used was, I believe, one of the first developed, and I rode with its crew almost continuously for ten days."

"We want to find defects in our rails before they reach the danger state," Mr. Blowers continues. "And Sperry's testing effectiveness is shown by the fact that, during our 1954 Spring testing, 87% of the defects found were small size (under 20%); and, during our Fall testing, 84% were small. This is valuable protection against accidents and delays to our heavy, high-speed trains."

To give safer, faster service at lower cost, the Erie is constantly modernizing with remote control interlocking, CTC, mechanized track equipment, and many other improvements. Mr. Blowers adds, "Sperry testing is part of this program. At present, we test main line tracks in both Spring and Fall; the balance of our more important branch lines are tested once each year. Close cooperation between Sperry crews and our division operating personnel cuts the time loss to a minimum during Detector Car movement."

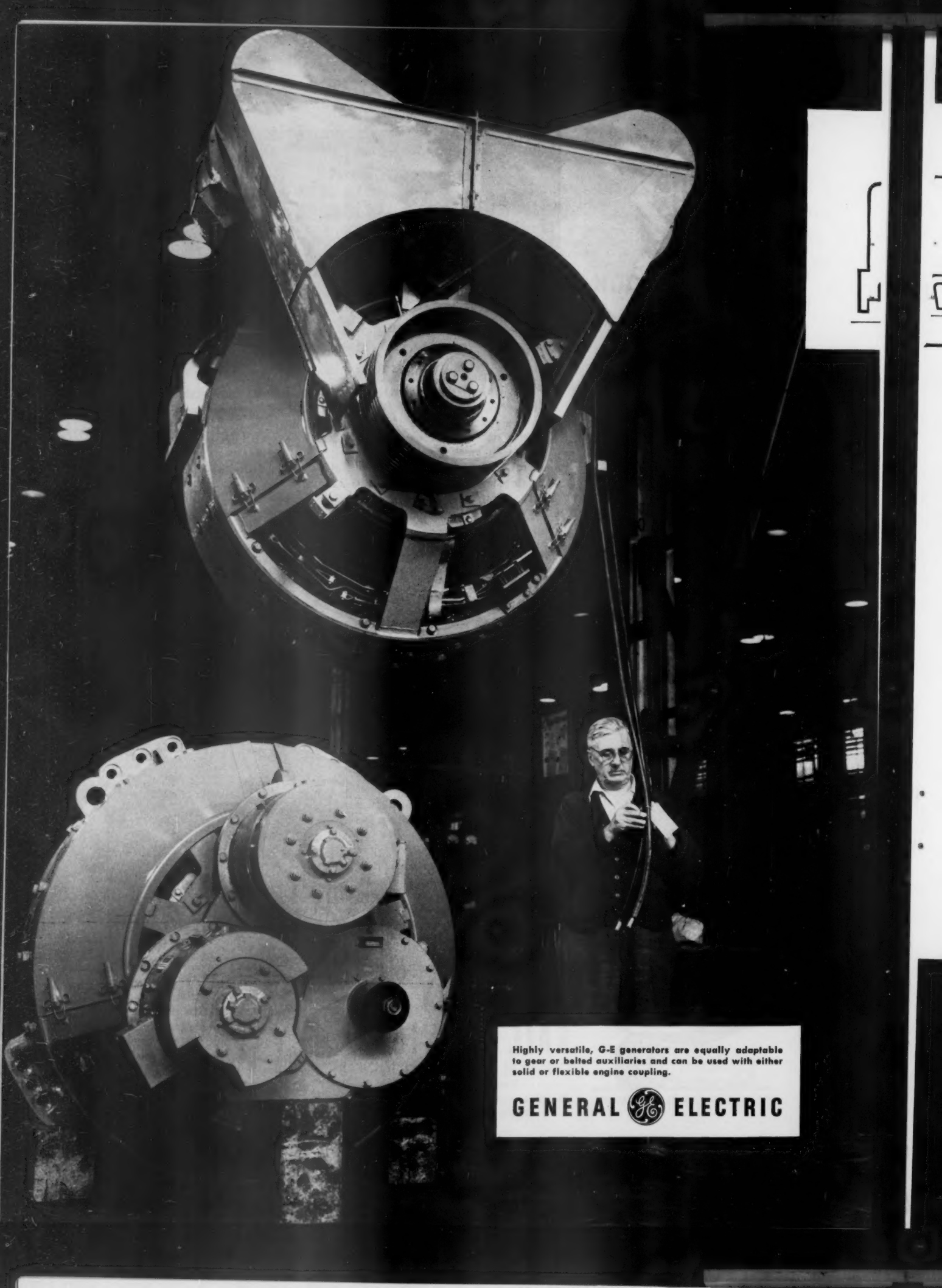
Sperry Rail Service will continue to meet rail inspection requirements with the most advanced equipment our research and engineering can provide. Our trained personnel serve you with the skill only long experience can assure. For information on any nondestructive testing application you may have, call or write us today.

Sperry

FIRST IN RAIL TESTING

SPERRY RAIL SERVICE

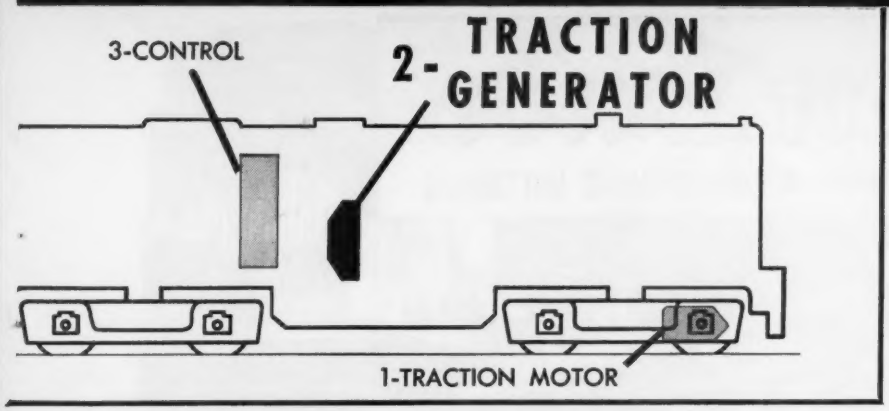
Division of Sperry Products, Inc.
Danbury, Conn.
New York Chicago St. Louis



Highly versatile, G-E generators are equally adaptable to gear or belted auxiliaries and can be used with either solid or flexible engine coupling.

GENERAL ELECTRIC

3 REASONS WHY THE G-E TRACTION SYSTEM SETS THE INDUSTRY STANDARD



THREE SUPERIOR COMPONENTS, installed as an integrated system, help you get rugged, flexible motive power that assures better locomotive utilization and easier maintenance.

Most reliable in railroad service today . . .

HOW G.E. BUILDS TRACTION GENERATORS TO REDUCE LOCOMOTIVE ROAD FAILURES

Flashovers occur on all locomotives. However, road failures due to generator flashovers are practically unknown on locomotives equipped with G-E traction generators. In most cases, if a G-E generator flashes over, it simply recovers and the locomotive continues its run. This means less repair time and greater locomotive availability.

RUGGED DESIGN. Features that assure low flashover damage in G-E traction generators include: inherently high machine stability; mycalex brush holder insulators which unlike the porcelain insulators in other generators will not shatter during flashover; and, a brush holder shield that drastically reduces damage to the brush rigging.

SIMPLE CONSTRUCTION. G-E traction generators are simple in construction. They are self-ventilated machines and do not require separate blowers. While other machines have as many as six field windings, the G-E generator has only three—a real contribution to easier maintenance.

Ask your G-E Apparatus Sales Representative for more information about this generator—one of the superior components of the traction system that sets the industry standard. For G.E.'s new color film "The ABC of Flashovers" write Section 115-4A, General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

These high-speed photos from G.E.'s revolutionary film, "The ABC of Flashovers," show accurately what happens when a generator is flashed over.

1. The flash begins its path over the commutator of a standard production generator.

2. Chain-like reaction next occurs as conductive gases erupt and blaze across the entire commutator.

3. Climax is reached in violent explosion. Generator took over 400 flashovers in test.

FACTS ABOUT Exide®

IRONCLAD® CAR LIGHTING AND AIR CONDITIONING BATTERIES

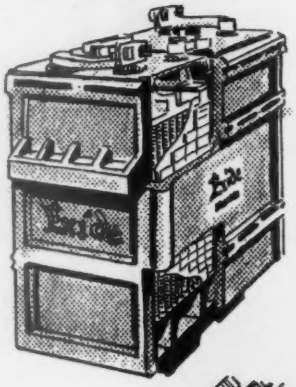
PASSENGERS LIKE THE GREAT BRIGHT ROADWAY! ... ASSURED BY EXIDES

WELL-LIGHTED, COOL COMFORTABLE CARS ATTRACT MORE PASSENGERS. MAKE SURE YOUR EQUIPMENT FUNCTIONS AT TOP EFFICIENCY WITH EXIDE-IRONCLADS. THEIR HIGH UNIFORM VOLTAGE, EXCEPTIONALLY LONG LIFE, AND LOW COSTS COMBINE TO MAKE EXIDE-IRONCLADS YOUR BEST BATTERY BUY— *AT ANY PRICE!*

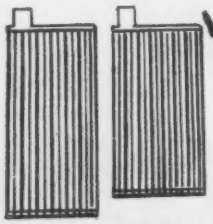
INTRODUCING... THE NEW EH EXIDE-IRONCLAD!

TO SET A NEW STANDARD FOR RAILWAY PERFORMANCE, EXIDE INTRODUCES AN ALL-NEW ENGINEERED AND FIELD-TESTED CAR LIGHTING AND AIR CONDITIONING BATTERY. THE NEW EH—

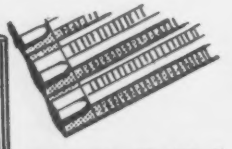
- DELIVERS 100% CAPACITY INITIALLY!
- ITS UNIFORM QUALITY ASSURES SUSTAINED HIGH CAPACITY DURING LONGER USEFUL LIFE!



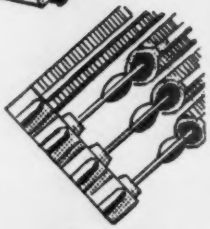
THE NEW EH HAS...



10% LONGER PLATES IN THE SAME SPACE YOU GET MORE POWER FOR A LONGER TIME!



POLYETHYLENE SLOTTED TUBES, AND SEALERS NON-OXIDIZING PLASTIC GIVES LONGER LIFE... PREVENTS SHORTS!



GRIDS WITH SILVIUM THIS NEW EXIDE NON-CORROSIVE ALLOY GIVES HIGH SUSTAINED POWER...LONGER LIFE!

"ANY ICE TODAY, LADY?"

TRAVEL COMFORT IN 1876 WAS AIDED BY THE TRAIN BOY WITH HIS CAN OF ICE WATER. "AIR CONDITIONING" CAME THROUGH THE WINDOWS. LIGHTING WAS INADEQUATE AND DANGEROUS. IT'S ALL DIFFERENT NOW WITH HELP FROM DEPENDABLE EXIDES—MR. AVERAGE PASSENGER RIDES IN WELL-LIGHTED, COMFORTABLY AIR CONDITIONED CARS.

WRITE NOW, CALL YOUR EXIDE SALES OFFICE FOR SPECIFICATIONS OF THE NEW EH. *TEST* IT YOURSELF. YOU'LL FIND THE NEW EH EXIDE-IRONCLAD IS YOUR BEST POWER BUY *—AT ANY PRICE!*

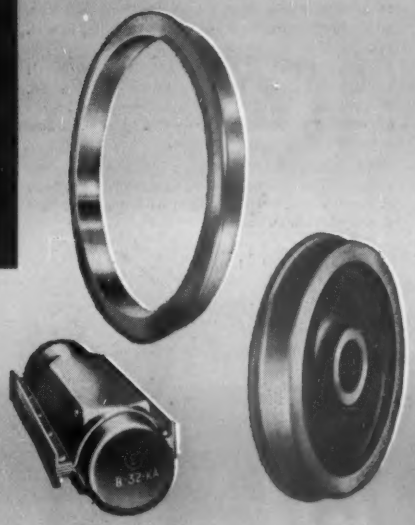
Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Two Road Systems at Work! By Hungerford

We will be glad to send you enlarged copies of this Hungerford cartoon (without advertising copy) for posting on your office and shop bulletin boards, or a cut for your company magazine, at cost.

E Edgewater Steel Company

PITTSBURGH, PA.



Serving America's Railroads

with ROLLED STEEL TIRES
ROLLED STEEL WHEELS
AND DRAFT GEARS

LOW CONDUCTIVITY... Thoroughly washed and sterilized, all-hair heat barrier. Rated conductivity —.25 btu per square foot, per hour, per degree F., per inch thick.

LIGHT WEIGHT... Advanced processing methods reduce weight of STREAMLITE HAIRINSUL by 40%.

PERMANENT... Does not disintegrate when wet, resists absorption. Will not shake down, is fire-resistant and odorless.

EASY TO INSTALL... Blankets may be applied to car wall in one piece, from sill to plate and from one side door to the other. Self-supporting in wall sections between fasteners.

COMPLETE RANGE... STREAMLITE HAIRINSUL is available ½" to 4" thick, up to 127" wide. Stitched on 5" or 10" centers between two layers of reinforced asphalt laminated paper. Other weights and facings available.

HIGH SALVAGE VALUE... The all-hair content does not deteriorate with age; therefore has high salvage value. No other type of insulation offers a comparable saving.

OUTLASTS THE LIFE OF THE CAR

That bright new refrigerator car coming out of the shop will someday wear out, be sold for scrap or be junked, but the STREAMLITE HAIRINSUL originally used in the car can be salvaged to be used again. It actually outlasts the life of the car!

STREAMLITE HAIRINSUL's high insulating efficiency remains the same year in and year out. Records show where all-hair insulation removed from refrigerator cars after 20 years or more of service, is in like new condition. All-hair insulation does not deteriorate with age. Its salvage value is high.

At left are additional reasons why STREAMLITE HAIRINSUL is the leading car insulation. Write for complete data.

MERCHANDISE MART, CHICAGO 54

Streamlite AMERICAN HAIR & FELT CO. HAIRINSUL

SETS THE STANDARD BY WHICH ALL OTHER REFRIGERATOR CAR INSULATIONS ARE JUDGED

RUST-OLEUM Protects Metal...

Saves Even Badly Rusted Surfaces!

The Practical Way To Cut Maintenance Costs — Add Extra Life To Rolling Stock, Bridges, Towers, Tanks, Metal Equipment!

Here's how easy it is to stop rust with RUST-OLEUM! Simply apply RUST-OLEUM by brush, dip, or spray directly over rusted surfaces . . . after removing rust scale and loose particles by wirebrush and sharp scrapers. Costly sandblasting and chemical pre-cleaning are not usually required. Dries to a firm, elastic, durable coating. See how RUST-OLEUM can cut your maintenance costs. Specify RUST-OLEUM for all new construction, maintenance, repair or rebuilding.

New RUST-OLEUM Railroad Catalog
Send for your free copy of this new catalog today—for the facts on how RUST-OLEUM can cut your maintenance costs.

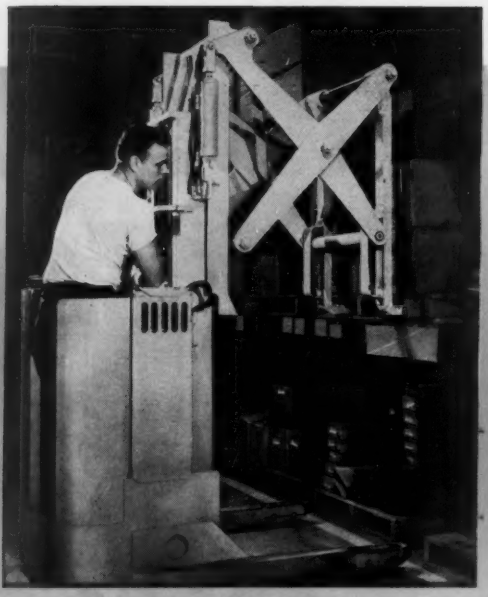
In All Colors, Aluminum and White

RUST-OLEUM CORPORATION
2596 Oakton Street, Evanston, Illinois

RUST-OLEUM STOPS RUST!

Stopping Rust with RUST-OLEUM 769 D.P. Red Primer

There's more than meets the eye in



ALCO'S NEW ST. LOUIS WAREHOUSE: New reach-type fork trucks are typical of the modern materials-handling equipment that can give better, faster service to 50 south-central area railroads with ALCO diesel-electric locomotives.

Alco

AMERICAN

. . Genuine Alco Renewal Parts

Consider these four main features:

1. The latest design features: All genuine ALCO parts incorporate latest features developed through ALCO's extensive laboratory and field research. This means better performance, greater operating economy and protection against failure.

2. Superior quality control and full warranty: Quality Control at ALCO ranges from microscopic analysis of metals to mechanical testing of giant forgings. Backed by full warranty, all genuine ALCO parts meet strict specifications—established by specialists in railroad motive power.

3. Stock reduction plan: This new service offered by ALCO provides for the reduction of railroad inventories by absorbing surpluses into ALCO's world-wide supply system. Returns are credited by ALCO against parts purchases.

4. Multiple supply from single source: Market research, competitive price and other advantages of multiple buying and supply are available at *one source.* Modernization material, for example, is available in kit form for immediate shipment. Strategic locations of ALCO warehouses insure fast delivery, low shipping costs.

Contact your ALCO Sales Representative for full particulars.

And . . . there's more than meets the eye in . . .

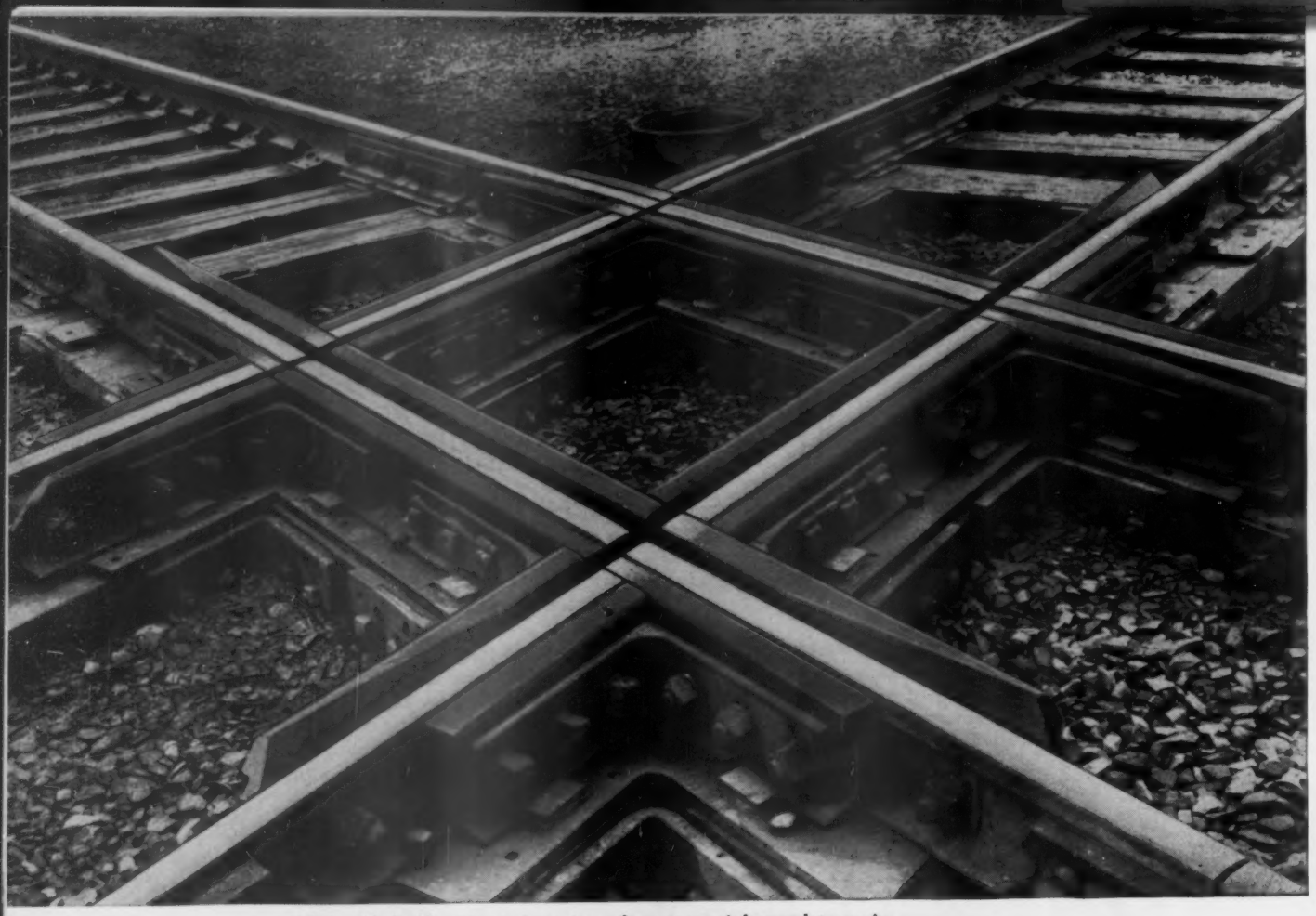
ALCO'S NEW CHICAGO WAREHOUSE: This new 29,000 sq ft warehouse is equipped with specially designed racks and bins for storing palletized stocks. More than 5000 mechanical, electrical and non-wearing parts are available here.

ALCO'S ORDER SERVICING: In every ALCO Renewal Parts Warehouse, regional management maintains a perpetual inventory. This assures that stocks are always at the highest possible service levels in line with customers' needs.

ALCO'S FULL LINE OF DIESEL-ELECTRIC LOCOMOTIVES offers the ideal motive power for your needs. For example, this ALCO DL-600 can economically handle passenger, freight, transfer and switching assignments.

LOCOMOTIVE COMPANY

Sales and Service Offices in Principal Cities



U.S. Steel bolted heat-treated crossing, after one year's heavy-duty service.

IN JUST ONE YEAR...

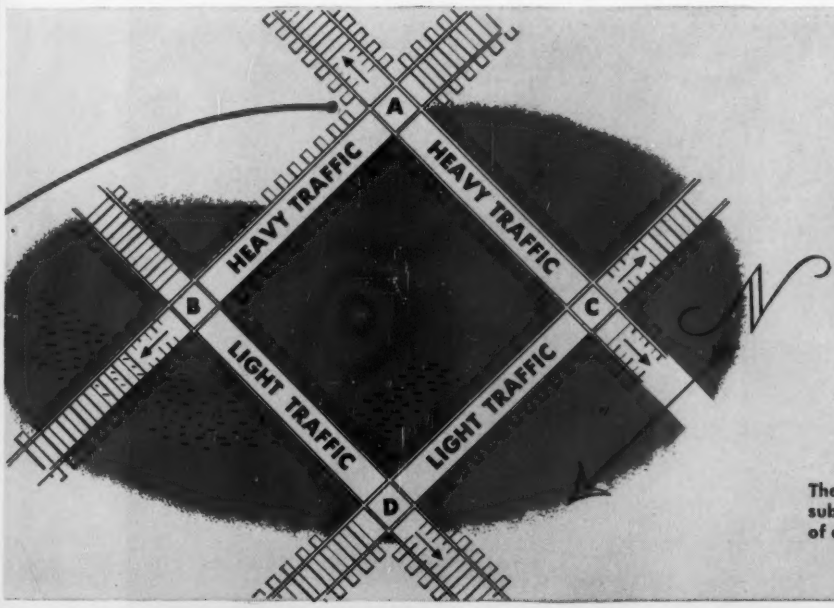
USS Heat-treated Crossing proves superiority over other crossings

THESE four crossings were installed at a major eastern railroad crossing in the Spring of 1953. Of the four, one was a U.S. Steel heat-treated bolted crossing and the others were of a competitive type and manufacture.

After one year of service, the crossings were carefully examined for wear. The USS heat-treated crossing—although it had been subjected to the heaviest traffic conditions (see diagram)—showed less wear than the other crossings.

The full heat treatment of rails, pioneered by U.S. Steel, not only increases their hardness and resistance to wear; it increases their strength, toughness, and resistance to impact. Moreover, these properties are imparted not only to the surface of the rail head, but to the entire rail including the web and the base. Such superior qualities provide longer life for trackwork, resulting in considerable savings to the railroad using the product.

For further information, write to United States Steel Corporation, 525 William Penn Place, Room 4712, Pittsburgh 30, Pennsylvania.



A. USS Heat-treated Crossing

1. South to North Traffic. Loaded coal trains. 35 MPH freights heavy in summer, light in winter, plus one local freight daily.
2. East to West and West to East. Two 70 MPH passenger and four 50 MPH freights daily. One local freight. (High speed traffic causes as much or more wear than heavy tonnage.)

B. Competitive Type Crossing

1. South to North Traffic. Same as crossing "A"-1, above.
2. East to West Traffic. Very light (siding traffic only).

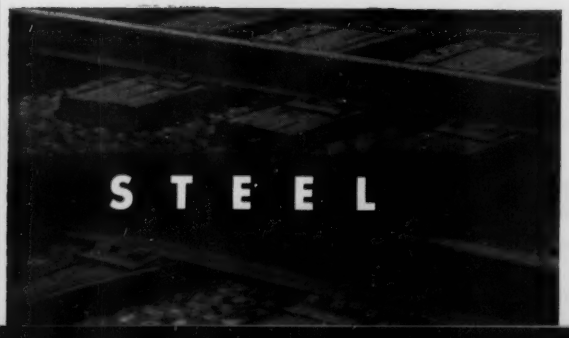
C. Competitive Type Crossing

1. North to South traffic. Empty coal trains and one local freight daily.
2. East to West and West to East traffic. Same as crossing "A"-2, above.

D. Competitive Type Crossing

1. North to South traffic. Same as crossing "C"-1, above.
2. East to West traffic. Same as crossing "B"-2, above.

The combination of heavy freight and high-speed passenger trains subjects the USS heat-treated bolted crossing to the heaviest traffic of all described above.



USS

STEEL

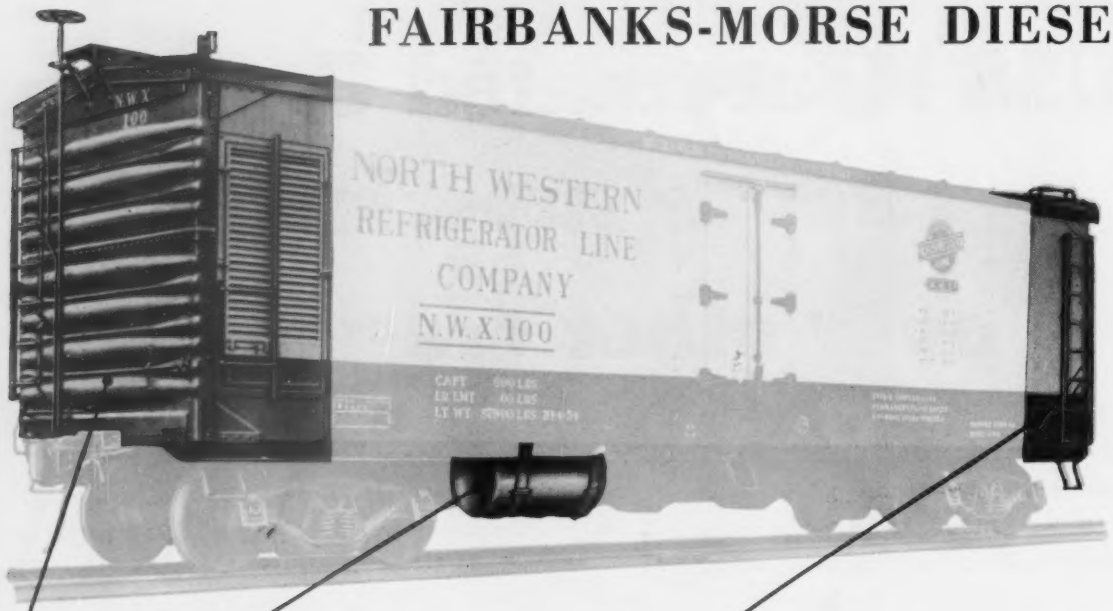
TRACKWORK

UNITED STATES STEEL CORPORATION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, BIRMINGHAM
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

PROVED BY A YEAR ON THE RAILS

Powered by a compact

FAIRBANKS-MORSE DIESEL



12-day fuel supply

The fuel economy of conservatively rated Fairbanks-Morse engine permits continuous operation for as long as twelve days on the small volume of fuel carried in these two tanks mounted on the underframe.

10% increase in cargo space

Space formerly used for ice bunker in this end of car is now added to available cargo space—a 10% increase. This advantage not only applies to conversion of old reefers but to new car construction as well.

In the space of one bunker

The compact 16-horsepower Fairbanks-Morse Diesel engine selected to power this new system is ⅓ to ½ the size engine required by other mechanical refrigerator cars. Though small, this conservatively rated engine provides a reserve of power for direct drive of the four-cylinder compressor and the two 4000 c.f.m. condenser fans.

Engine, compressor and fans are common-base mounted to form a completely packaged unit. There's ample room in the bunker for routine terminal service, and condensing unit can be removed in a matter of minutes without disturbing engine mounting or connections. Direct drive design eliminates all electrical controls, making this power plant and entire system the most dependable available on the rails today. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Illinois.

FAIRBANKS-MORSE

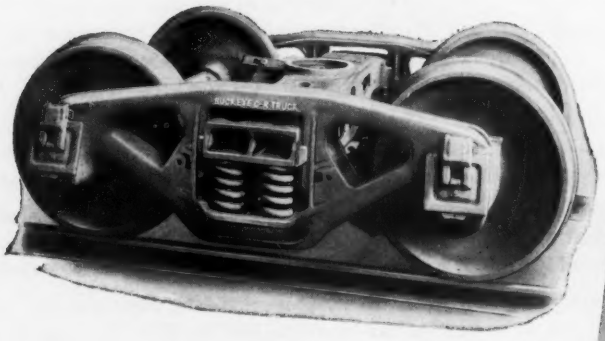
a name worth remembering when you want the best

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • RAIL CARS • ELECTRICAL MACHINERY • PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

ANOTHER Buckeye EXTRA

..AT NO EXTRA COST!

ACCURATE UNIPLANE* JIG GRINDING OF JOURNAL BOX LID FACE IMPROVES CLOSURE



First featured on Buckeye's famed C-R (Cushion Ride) truck . now standard process on all Buckeye trucks with integral journal boxes.

FOR COMPLETE INFORMATION . . CALL or WRITE

Refer Adv. No. 11872

The Buckeye Steel Castings Co.

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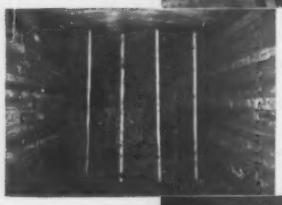
- NEW YORK, N.Y.
- CHICAGO, ILL.
- ST. PAUL, MINN.

Now! Low cost protection against boxcar infestation...

Economical Johns-Manville Stonefelt (Type K) reduces contamination risks, cuts damage claims

Open corrugations filled with Stonefelt.



Full-size pieces of Stonefelt temporarily in position.

End lining is applied the usual way.

Many costly claims can be avoided by filling the spaces behind boxcar linings where contaminating conditions can exist. When you protect these areas with Johns-Manville Stonefelt® (Type K), danger from insect infestation, corrosion, mold and odor is controlled at the source.

Stonefelt is made of specially treated mineral fibers felted into lightweight batts that *will not settle or shake down*. Strong and durable, its uniform structure of finely divided fibers stops the entrance of insects; acts as a barrier against dust and dirt.

Stonefelt fibers are inert, are not affected by moisture, will not sustain insect life. Virtually indestructible in service, Stonefelt provides continued protection against mold, odors and corrosion.

Stonefelt Type "K" is furnished in cut-to-fit box car sets. Individual pieces are supplied up to 30" x 60" to assure maximum ease of handling. Regular car men can easily apply this material.

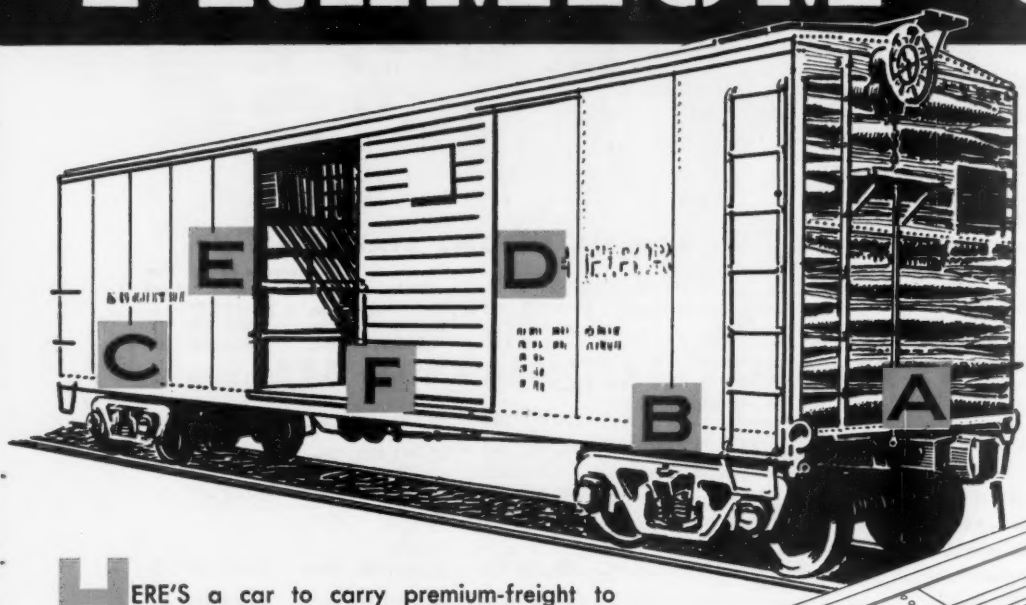
Ask your Johns-Manville representative for complete data and samples, or write to Johns-Manville, Box 60, New York 16, N. Y.

JM PRODUCTS **Johns-Manville** 96 YEARS OF SERVICE TO TRANSPORTATION

'PREMIUM' POWER *paid off!*

NOW IT'S THE

'PREMIUM' CAR

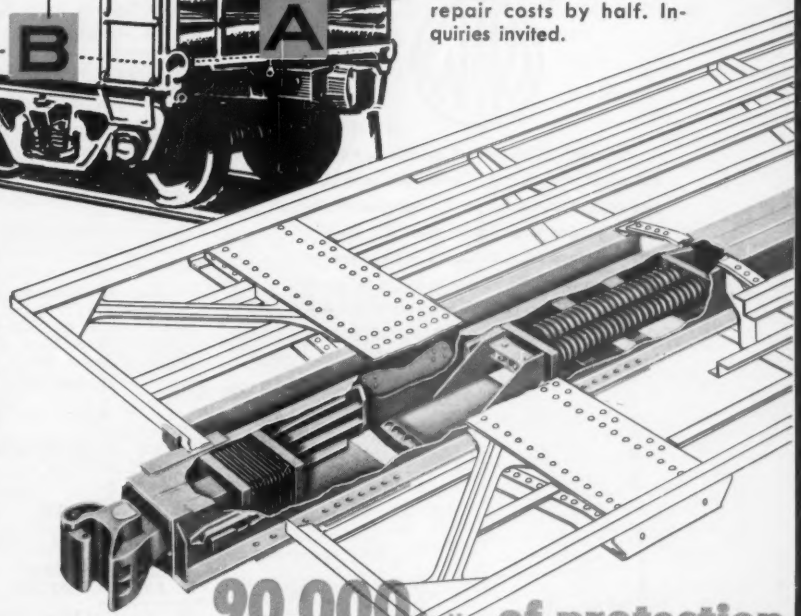


The only Cushion Underframe that eliminates free-slack, the Waugh High Capacity Cushion Underframe protects cars and lading at impact speeds far above the closing speed of conventional draft gears.

Studies indicate that this cushioning device will cut lading damage cost and car repair costs by half. Inquiries invited.

HERE'S a car to carry premium-freight to build traffic that pays a profit. Cushion Underframe equipped A it protects lading against excessive impacts. With improved trucks B and improved bearings C it is a smooth riding car. Extra wide doors D facilitate mechanical loading. Load retainers E reduce shifting and surfaced floors F are smooth and clean.

Every device is proven . . . the protection afforded actual. It is the freight car of tomorrow *ready today*.



90,000 ft. lbs. of protection

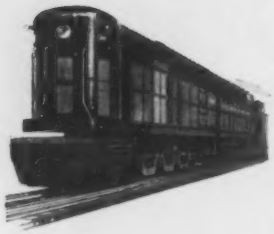
WAUGH

EQUIPMENT COMPANY 420 Lexington Ave., New York 17, N. Y.

CHICAGO · ST. LOUIS · CANADIAN WAUGH EQUIPMENT COMPANY, MONTREAL

Norfolk and Western RAILWAY COMPANY

Summarizes 1954 Results



The general decline in business acitivity in the first three quarters of 1954 was felt keenly by the Bituminous Coal industry as well as by the Company. However, by improving operating efficiency and effecting tax and other savings, the reduction in net income for the year was limited to about 6 per cent, in spite of a drop of 11 per cent in total revenues. At the same time a larger percentage of total operating revenues was brought down to net income—15.46 per cent, up from 14.81.

The cost of improvements to facilities during the year totaled $17.7 million, which was paid for without incurring any indebtedness.

A significant development was the acquisition of the Chesapeake Western Railway, a 53-mile connecting railroad serving a prosperous and stable territory in the Shenandoah Valley of Virginia.

N & W BRIEFS

	1954	1953	1952	1951	1950
Earnings per share of Common Stock	$4.52	$4.83	$5.05	$5.31	$5.05
Dividends declared per share —					
Adjustment Preferred Stock	$1.00	$1.00	$1.00	$1.00	$1.00
Common Stock	$3.50	$3.50	$3.50	$3.50	$3.50
Taxes (millions)	$27.5	$37.1	$39.6	$49.4	$35.1
Expenditures for Property and Equipment acquisitions and improvements (millions)	$17.7	$32.4	$28.8	$28.5	$23.3
Debt Outstanding (millions)	$35.8	$35.8	$35.8	$41.9	$43.9
Times Fixed Charges Earned	19.24	20.60	20.25	18.83	17.03
Number of Share Owners	31,818	31,022	29,500	26,551	22,607
Bituminous Coal Tonnage (million tons)	40.1	45.5	46.5	52.7	46.4
Other Tonnage (million tons)	16.2	18.2	17.7	19.0	16.7
Average Revenue per ton carried one mile (cents)	1.038	1.050	1.025	0.947	0.948
Gross ton miles per freight train hour	72,670	71,991	68,820	68,280	64,766
Miles of road operated	2,134	2,135	2,135	2,135	2,128

Although Bituminous Coal tonnage originating on Norfolk and Western declined 10.7 per cent, it amounted to 9.7 per cent of national production, which was the highest ratio achieved since 1941. The Management continues to be optimistic as to the future of Bituminous Coal, and believes that output will show definite improvement in 1955 with heavier Company loadings.

CONDENSED INCOME STATEMENT

	1954	1953	Increase or Decrease		Per Cent
REVENUES AND OTHER INCOME:					
Freight—Bituminous Coal	$ 92,387,158	$ 103,504,435	Dec.	$ 11,117,277	11
Other	65,640,612	73,036,908	Dec.	7,396,296	10
Passenger	4,049,316	4,913,775	Dec.	864,459	18
Mail, Express and Miscellaneous	7,982,653	8,105,151	Dec.	122,498	2
Total Railway Operating Revenues	170,059,739	189,560,269	Dec.	19,500,530	10
Rent Income—Equipment and Joint Facilities—Net	9,139,335	11,692,489	Dec.	2,553,154	22
Other Income—Net	1,646,380	1,781,613	Dec.	135,233	8
Total	180,845,454	203,034,371	Dec.	22,188,917	11
EXPENSES AND OTHER CHARGES:					
Way and Structures—Repairs and Maintenance	24,704,904	27,132,258	Dec.	2,427,354	9
Equipment—Repairs and Maintenance	35,891,876	40,229,811	Dec.	4,337,935	11
Transportation—Operations	53,682,136	57,661,174	Dec.	3,979,038	7
Other Expenses	11,351,500	11,426,385	Dec.	74,885	1
Total Railway Operating Expenses	125,630,416	136,449,628	Dec.	10,819,212	8
Taxes—Federal $19,429,450 State, County, Local and Miscellaneous 8,062,720	#27,492,170	37,075,655	Dec.	9,583,485	26
Interest on Funded Debt	1,431,668	1,431,668			
Total	154,554,254	174,956,951	Dec.	20,402,697	12
NET INCOME	26,291,200	28,077,420	Dec.	1,786,220	6
DIVIDENDS ON ADJUSTMENT PREFERRED STOCK	887,108	879,608	Inc.	7,500	1
	*25,404,092	27,197,812	Dec.	1,793,720	7
SINKING AND OTHER RESERVE FUNDS—APPROPRIATIONS	450,876	450,876			
BALANCE TRANSFERRED TO EARNED SURPLUS	24,953,216	26,746,936	Dec.	1,793,720	7

#Equivalent to $4.89 per share of Common Stock, compared with $6.59 in 1953.
*Equivalent to $4.52 per share of Common Stock, compared with $4.83 in 1953.

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AND MORE EFFICIENT, LOWER COST LIFTING!

The new booklet you see here should—and can be—on *your* desk. It tells the story of a *most efficient and practical means for removal of wheels and trucks.* Read from its pages how Whiting Electric Portable Jacks are built stronger, safer and more powerful to lift higher, quicker, easier at the lowest possible cost... and with synchronous movement. Have this, and other valuable information at your fingertips. Send for this free booklet today!

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City Zone State

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

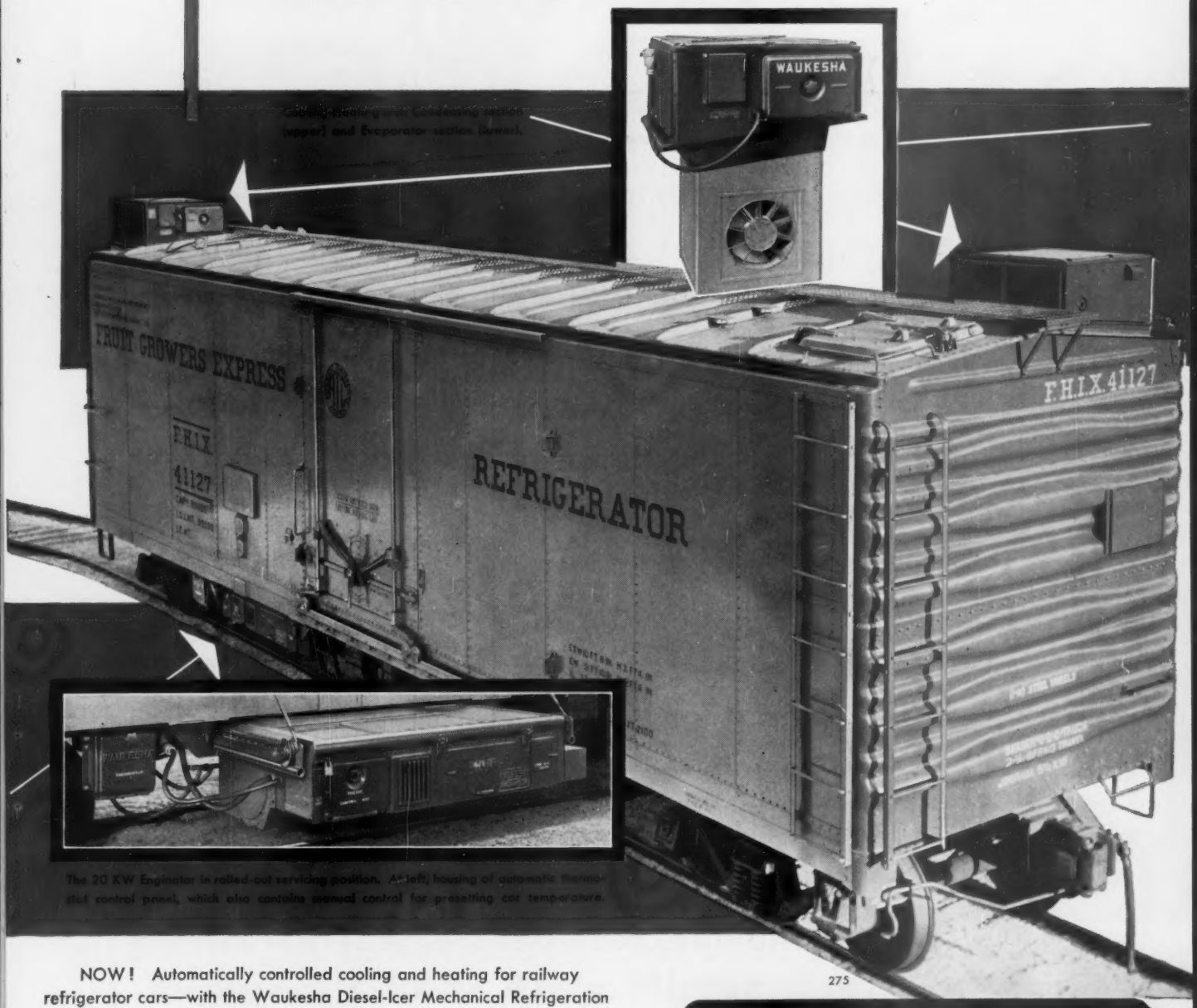
MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1955

Name of Road	Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1944	Total (inc. misc.) 1954	Operating Expenses: Maint. Way and Structures: Total 1955	Total 1954	Deprec. and Retirements	Maint. Equipment: Total 1955	Total 1954	Deprec. and Retirements	Traffic	Transportation	Total 1954	Total 1955	Operating ratio 1955	Operating ratio 1954	Net from railway operation	Railway tax accruals	Net railway operating income 1955	Net railway operating income 1954
Akron, Canton & Youngstown	Feb.	$171	$451	....	$458	$403	$63	$64	$6	$52	$57	$14	$43	$133	$331	$322	72.3	79.7	$127	$62	$52	$34
	2 mos.	171	884	....	900	806	125	118	12	102	127	28	86	264	658	662	73.1	82.1	242	109	93	54
Atcheson, Topeka & Santa Fe	Feb.	13,098	34,354	$2,717	40,638	41,082	5,251	5,906	634	7,710	8,597	1,944	1,157	13,200	29,296	30,856	72.1	75.1	11,343	6,198	4,844	4,500
	2 mos.	13,098	68,138	6,034	81,613	82,406	10,661	12,325	1,270	15,622	17,693	3,887	2,234	27,561	60,212	64,336	73.8	78.1	21,401	11,845	9,349	7,455
Atlanta & St. Andrews Bay	Feb.	82	326	1	331	296	26	25	3	25	17	5	6	65	140	132	42.3	44.6	191	83	74	52
	2 mos.	82	659	1	669	603	54	49	5	75	37	11	12	130	310	270	46.3	44.8	359	157	136	111
Atlanta & West Point*	Feb.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	2 mos.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Western of Alabama*	Feb.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	2 mos.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Atlantic & Danville	Feb.	205	132	....	135	148	23	25	2	12	12	5	9	39	93	107	69.4	72.0	41	9	8	7
	2 mos.	205	267	....	273	277	45	50	5	18	23	10	20	85	187	208	68.7	75.1	85	17	19	4
Atlantic Coast Line	Feb.	5,344	10,585	1,792	13,503	13,849	2,191	1,816	178	2,874	2,438	598	397	4,753	10,868	10,082	80.5	72.8	2,635	1,425	766	954
	2 mos.	5,344	21,063	3,704	27,111	27,502	4,438	3,699	328	5,879	5,093	1,196	812	9,815	22,244	20,736	82.0	75.4	4,867	2,350	1,678	2,286
Charleston & Western Carolina	Feb.	343	562	1	576	572	152	131	5	110	99	42	19	153	448	420	77.6	73.5	129	40	60	73
	2 mos.	343	1,137	2	1,163	1,103	300	269	21	214	196	85	38	315	894	850	76.8	77.0	269	90	128	126
Baltimore & Ohio	Feb.	6,184	25,990	1,306	29,195	29,142	3,192	3,311	520	5,397	5,671	1,011	861	12,384	23,472	23,784	80.4	81.6	5,723	1,797	2,783	2,507
	2 mos.	6,184	52,569	2,856	59,420	60,862	6,407	7,076	982	10,930	11,923	2,027	1,676	25,543	47,840	49,783	80.5	81.8	11,580	3,622	5,586	5,080
Staten Island Rapid Transit	Feb.	29	178	52	232	216	41	44	12	25	22	2	2	124	225	215	97.1	99.6	7	39	—55	—55
	2 mos.	29	357	106	468	451	82	88	23	49	46	4	3	258	460	445	98.2	98.7	8	79	—114	—110
Bangor & Aroostook	Feb.	602	1,125	35	1,200	1,458	325	325	16	263	248	90	20	365	1,035	1,044	86.3	71.6	164	18	137	215
	2 mos.	602	2,256	64	2,396	2,961	650	650	32	480	464	180	42	695	1,998	2,013	83.4	68.0	398	95	329	496
Bessemer & Lake Erie	Feb.	208	851	....	874	1,149	147	137	17	522	632	137	25	327	1,130	1,270	129.3	110.5	—256	11	—23	—18
	2 mos.	208	1,955	1	1,994	2,395	328	354	35	957	1,267	279	47	671	2,196	2,619	110.1	109.3	—202	122	223	3
Boston & Maine	Feb.	1,576	4,711	843	6,261	6,449	912	1,159	144	874	1,064	192	121	2,903	5,187	5,587	82.8	86.6	1,074	470	142	—100
	2 mos.	1,576	9,819	1,701	12,993	13,077	1,853	2,494	288	1,867	2,185	388	230	5,951	10,625	11,721	81.8	89.6	2,368	985	433	—578
Cambria & Indiana	Feb.	35	140	....	140	132	16	16	1	68	107	22	....	21	112	151	80.0	114.1[1]	28	85	99	73
	2 mos.	35	289	....	289	275	33	34	2	133	200	44	....	41	223	290	77.1	105.4	66	182	209	161
Canadian Pacific Lines in Maine	Feb.	234	670	47	742	764	100	83	5	150	118	17	8	332	606	488	81.7	63.8	136	32	56	200
	2 mos.	234	1,388	114	1,563	1,470	190	142	11	252	238	35	17	671	1,162	961	74.3	65.4[1]	401	63	238	346
Canadian Pacific Lines in Vermont	Feb.	90	182	16	215	210	33	41	6	30	30	....	7	114	193	197	89.7	94.2	22	13	—49	—56
	2 mos.	90	371	27	434	433	107	80	45	62	63	....	14	228	429	408	98.9	94.4	5	25	—134	—115
Central of Georgia	Feb.	1,764	2,960	158	3,378	3,234	525	515	50	579	562	144	155	1,260	2,700	2,710	79.9	83.8	677	223	396	224
	2 mos.	1,764	6,088	322	6,981	6,529	1,036	1,028	86	1,170	1,104	300	313	2,579	5,479	5,505	78.5	84.3	1,502	454	943	472
Central of New Jersey	Feb.	613	3,576	429	4,311	4,353	580	543	92	788	820	179	70	1,857	3,480	3,548	80.7	81.5	831	469	216	239
	2 mos.	613	7,326	907	8,874	9,046	1,156	1,122	184	1,674	1,656	358	140	3,847	7,197	7,397	81.1	81.8	1,678	921	384	573
Central Vermont	Feb.	422	711	70	837	924	172	202	16	116	112	11	15	338	684	741	81.7	80.2	153	40	—2	57
	2 mos.	422	1,440	129	1,697	1,843	287	305	33	234	231	22	31	700	1,334	1,412	78.6	76.6	363	80	48	152
Chesapeake & Ohio	Feb.	5,111	23,775	473	25,335	22,157	3,120	3,345	767	4,492	4,864	1,513	657	8,602	18,038	18,052	71.2	81.5	7,296	3,096	4,579	3,209
	2 mos.	5,120	48,593	1,035	51,849	46,397	6,483	6,924	1,144	9,301	10,269	3,027	1,335	17,547	37,049	37,550	71.5	80.9	14,800	6,421	9,212	6,647
Chicago & Eastern Illinois	Feb.	868	2,286	194	2,736	2,633	348	339	28	450	481	133	140	1,108	2,234	2,133	81.6	81.0	503	53	301	278
	2 mos.	868	4,721	441	5,687	5,376	684	681	52	893	962	266	276	2,286	4,509	4,359	79.3	81.1	1,178	226	692	538
Chicago & Illinois Midland	Feb.	130	611	....	623	431	70	75	6	116	155	23	32	177	441	488	70.8	113.1	182	111	71	—109
	2 mos.	130	1,290	....	1,318	968	134	145	12	239	308	46	73	367	906	1,009	68.8	104.2	411	219	155	—151
Chicago & North Western	Feb.	7,873	11,014	1,489	14,077	13,569	2,129	2,251	335	2,816	2,591	837	393	6,776	12,929	12,733	91.8	93.8	1,149	1,060	—501	—908
	2 mos.	7,873	22,274	3,207	28,751	27,708	4,297	4,374	664	5,704	5,196	1,674	757	13,861	26,298	25,916	91.5	93.5	2,453	2,143	—861	—1,542
Chicago, Burlington & Quincy	Feb.	8,858	14,759	1,225	17,882	20,255	2,195	2,068	373	3,410	3,568	834	485	7,309	14,174	14,234	79.3	70.3	3,708	1,818	1,627	2,679
	2 mos.	8,858	29,831	2,750	36,465	40,304	4,362	4,451	768	6,850	7,139	1,670	1,009	15,042	28,915	29,337	79.3	72.8	7,550	3,672	3,247	4,756
Chicago Great Western	Feb.	1,470	2,481	4	2,639	2,549	416	376	46	386	415	121	111	825	1,806	1,796	68.4	70.4	833	328	309	291
	2 mos.	1,470	5,062	11	5,389	5,210	831	751	88	771	828	241	220	1,694	3,664	3,640	68.0	69.9	1,725	668	631	599
Chicago, Indianapolis & Louisville	Feb.	541	1,508	60	1,707	1,677	263	262	18	264	252	73	91	626	1,351	1,270	79.1	75.7	356	118	142	183
	2 mos.	541	3,015	130	3,436	3,323	526	511	37	527	495	146	185	1,274	2,730	2,564	79.4	77.2	706	232	278	329
Chicago, Milw., St. Paul & Pacific	Feb.	10,641	15,018	882	17,582	17,779	2,531	2,490	436	3,750	4,015	914	435	7,297	15,004	15,410	85.3	86.7	2,578	1,327	622	380
	2 mos.	10,641	30,501	1,963	36,045	35,276	5,231	5,057	836	7,621	8,317	1,825	846	15,051	30,758	31,859	85.3	90.3	5,287	2,666	1,390	—404
Chicago, Rock Island & Pacific	Feb.	7,924	11,442	1,271	14,010	14,517	1,659	1,706	266	2,581	2,548	574	469	5,457	10,976	11,105	78.3	76.5	3,034	1,163	1,195	1,248
	2 mos.	7,924	22,952	2,822	28,480	29,325	3,321	3,422	495	5,114	5,208	1,147	951	11,275	22,326	22,801	78.4	77.7	6,154	2,218	2,622	2,516
Chicago, St. Paul, Minn. & Omaha	Feb.	1,616	2,134	128	2,445	2,450	338	377	48	353	384	88	65	1,276	2,161	2,208	88.4	90.1	284	168	—218	—161
	2 mos.	1,616	4,438	277	5,099	4,989	680	720	95	758	799	177	132	2,586	4,415	4,538	86.6	91.0	684	343	—302	—428
Clinchfield*	Feb.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	2 mos.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

*Because of a strike, figures for the A&WP, WofAla and Clinchfield are not available.

WAUKESHA

diesel-icer automatic refrigerating and heating system for railway refrigerator cars



The 20 KW Enginator in rolled-out servicing position. At left, housing of automatic thermostat control panel, which also contains manual control for presetting car temperature.

NOW! Automatically controlled cooling and heating for railway refrigerator cars—with the Waukesha Diesel-Icer Mechanical Refrigeration System. Applied to existing ice-cooled cars without modification of car structure. This system will increase loading capacity—because ice bunkers may be removed. And, it's applicable to new cars built for mechanical refrigeration.

The Waukesha Diesel-Icer System consists of a 20 KW Enginator (a 6-cylinder, 4-cycle Waukesha horizontal Diesel engine direct-connected to a 220-volt, 3-phase, 60-cycle alternator) and two motor-driven Cooling-Heating units for low temperature or all-purpose cars. Only one Cooling-Heating unit is required in cars used exclusively in 35° service. *Write for Bulletin 1667.*

275

WAUKESHA diesel-icer SYSTEM

RAILWAY DIVISION
WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN

Largest Builders of mobile engine-driven Refrigeration and Generator Equipment

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1955

Name of Road		Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1954	Total (inc. misc.) 1954	Operating Expenses: Maint. Way and Structures: Total 1955	Total 1954	Deprec. and Retirements	Maint. Equipment: Total 1955	Total 1954	Deprec. and Retirements	Traffic	Transportation	Total 1955	Total 1954	Operating ratio 1955	Operating ratio 1954	Net from railway operation	Railway tax accruals	Net railway operating income 1955	Net railway operating income 1954
Colorado & Southern	Feb.	724	905	62	1,074	1,009	159	134	18	153	211	41	27	405	801	815	74.6	80.7	273	137	108	79
	2 mos.	724	1,927	130	2,286	2,086	332	241	36	332	414	83	62	847	1,692	1,674	74.0	80.3	594	296	242	165
Ft. Worth & Denver	Feb.	1,038	1,402	114	1,669	1,721	385	272	41	258	217	44	60	603	1,407	1,255	84.3	72.9	263	65	59	229
	2 mos.	1,038	2,931	252	3,481	3,600	694	678	53	527	446	88	123	1,295	2,837	2,669	81.5	74.1	644	165	267	431
Colorado & Wyoming	Feb.	40	160	....	292	220	31	18	1	35	22	11	1	104	185	148	63.5	67.1	106	59	47	39
	2 mos.	40	329	....	554	459	50	25	3	69	54	22	3	213	360	295	65.0	64.3	194	109	84	82
Columbus & Greenville	Feb.	168	128	....	133	151	26	25	4	22	22	6	6	44	116	115	87.1	76.2	17	10	7	13
	2 mos.	168	240	....	250	307	54	59	7	55	61	12	11	86	241	260	96.6	84.6	8	18	—10	13
Delaware & Hudson	Feb.	792	3,785	146	4,040	3,849	494	570	47	737	845	183	83	1,397	2,917	3,205	72.2	83.3	1,123	447	629	330
	2 mos.	792	7,724	318	8,274	7,768	1,032	1,139	99	1,518	1,710	362	166	2,897	6,042	6,585	73.0	84.8	2,232	943	1,214	549
Delaware, Lackawanna & Western	Feb.	962	4,936	753	6,242	6,297	747	751	237	968	1,129	314	175	2,990	5,155	5,218	82.6	82.9	1,037	402	436	551
	2 mos.	962	10,094	1,569	12,802	13,027	1,425	1,515	371	1,942	2,309	626	360	6,173	10,466	10,748	81.8	82.5	2,336	925	918	1,116
Denver & Rio Grande Western	Feb.	2,165	5,256	205	5,627	5,452	486	516	99	885	943	284	191	1,614	3,469	3,498	61.6	64.2	2,158	1,136	1,150	1,052
	2 mos.	2,165	10,618	418	11,380	11,177	931	1,016	195	1,812	1,931	569	381	3,434	7,124	7,359	62.6	65.8	4,255	2,198	2,249	1,983
Detroit & Mackinac	Feb.	232	176	3	182	147	35	40	3	27	19	9	3	39	116	103	63.9	73.0	66	34	33	22
	2 mos.	232	329	3	338	286	70	80	5	54	42	19	7	74	228	218	67.5	76.5	110	61	57	39
Detroit & Toledo Shore Line	Feb.	50	697	....	755	697	82	78	3	67	62	18	19	196	379	358	50.3	51.4	375	126	106	98
	2 mos.	50	1,394	....	1,507	1,425	164	164	6	124	122	36	36	403	756	734	50.2	51.5	751	258	216	202
Detroit, Toledo & Ironton	Feb.	464	1,629	....	1,683	1,683	232	223	24	243	262	93	42	404	975	1,039	57.9	61.8	708	350	383	318
	2 mos.	464	3,198	....	3,310	3,528	460	473	48	402	549	185	84	809	1,869	2,221	56.5	63.0	1,441	716	782	643
Duluth, Missabe & Iron Range	Feb.	569	325	1	375	395	317	516	62	503	778	112	11	442	1,427	1,987	380.8	503.0	—1,053	78	—1,187	—1,735
	2 mos.	569	561	1	663	662	620	1,119	124	1,049	1,647	220	21	936	2,919	4,199	440.3	634.4	—2,256	159	—2,484	—3,777
Duluth, South Shore & Atlantic	Feb.	553	532	3	564	536	106	105	10	110	140	23	28	177	443	484	78.7	90.3	120	25	77	21
	2 mos.	553	1,030	8	1,087	1,041	228	236	21	233	272	46	55	359	920	998	84.6	95.9	167	50	82	—19
Duluth, Winnipeg & Pacific	Feb.	175	534	1	539	463	61	63	4	74	64	2	5	226	374	349	69.4	75.3	165	41	40	—3
	2 mos.	175	1,038	1	1,050	905	113	119	9	142	131	4	12	443	726	713	69.1	78.8	324	80	69	—49
Elgin, Joliet & Eastern	Feb.	236	2,840	....	3,521	3,598	208	431	24	538	2,597	113	33	1,300	2,253	4,652	64.0	129.3	1,268	608	424	—1,659
	2 mos.	236	5,827	....	7,247	7,533	416	613	47	1,033	5,231	226	64	2,617	4,471	9,282	61.7	123.2	2,776	1,402	991	—2,883
Erie	Feb.	2,224	10,519	516	11,848	12,196	1,158	1,451	266	1,980	2,097	510	358	5,245	9,423	9,657	79.5	79.3	2,426	896	990	1,006
	2 mos.	2,224	21,217	1,104	24,032	24,930	2,348	2,984	533	3,975	4,266	1,021	717	10,818	19,222	19,850	80.0	79.6	4,811	1,544	1,996	2,128
Florida East Coast	Feb.	571	2,397	715	3,395	3,308	442	350	42	562	451	99	75	1,078	2,333	2,220	68.7	67.1	1,062	332	496	530
	2 mos.	571	4,852	1,456	6,941	6,428	859	696	91	1,092	984	192	153	2,327	4,804	4,594	69.2	71.5	2,137	649	1,004	878
Georgia Railroad*	Feb.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	2 mos.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Georgia & Florida	Feb.	332	265	....	269	276	78	89	3	31	37	8	18	75	218	240	81.1	87.2	51	14	15	—14
	2 mos.	332	537	....	546	560	155	180	8	62	78	15	37	156	441	500	81.0	89.2	104	29	32	—28
Grand Trunk Western	Feb.	952	4,181	193	4,773	4,999	522	625	53	763	845	94	75	2,143	3,697	3,805	77.5	76.1	1,076	306	354	658
	2 mos.	952	8,329	419	9,480	9,541	1,083	1,253	106	1,549	1,715	189	151	4,391	7,570	7,753	79.9	81.3	1,910	621	508	614
Can. Natl Lines in New Eng	Feb.	172	193	5	230	159	59	53	9	28	29	....	3	118	224	227	97.2	142.6	6	24	—82	—147
	2 mos.	172	364	9	430	353	121	121	19	68	82	....	6	251	482	511	112.1	144.8	—52	48	—229	—317
Great Northern	Feb.	8,300	15,225	682	16,946	16,415	2,735	2,666	355	3,290	3,783	711	400	6,334	13,586	13,995	80.2	85.3	3,360	1,625	1,299	361
	2 mos.	8,300	30,049	1,423	33,630	30,615	5,207	5,480	715	6,832	7,800	1,425	824	12,874	27,392	28,980	81.4	94.7	6,239	3,116	2,397	—2,323
Green Bay & Western	Feb.	224	361	....	368	359	47	63	4	36	43	8	21	103	223	238	60.5	66.4	145	75	45	46
	2 mos.	224	677	....	692	698	94	121	8	79	87	16	44	210	462	492	67.1	70.6	230	116	64	67
Gulf, Mobile & Ohio	Feb.	2,757	5,638	273	6,308	6,596	938	908	77	1,139	1,361	283	264	1,888	4,585	4,945	72.7	75.0	1,723	687	674	660
	2 mos.	2,757	11,321	656	12,831	13,585	1,924	1,816	161	2,353	2,674	566	535	3,921	9,427	10,063	73.5	74.1	3,404	1,371	1,362	1,361
Illinois Central	Feb.	6,539	18,397	1,704	22,264	21,821	3,212	3,346	376	3,721	4,075	768	519	8,121	16,657	17,046	74.8	78.1	5,607	2,870	2,130	1,693
	2 mos.	6,539	36,479	3,554	44,439	45,136	6,349	6,749	757	7,671	8,428	1,519	1,077	16,499	33,685	35,062	75.8	77.7	10,754	5,713	4,145	3,631
Illinois Terminal	Feb.	355	737	44	879	846	109	138	25	151	155	41	42	373	726	733	82.6	86.6	153	72	50	47
	2 mos.	355	1,442	91	1,738	1,682	209	271	49	287	340	83	87	781	1,474	1,536	84.9	91.4	263	134	82	54
Kansas City Southern	Feb.	891	3,100	105	3,514	3,311	331	410	42	391	340	91	84	1,019	1,947	1,990	55.4	60.1	1,567	704	651	562
	2 mos.	891	6,126	207	6,967	6,821	639	697	81	805	777	183	178	2,083	3,945	4,011	56.6	58.8	3,021	1,342	1,252	1,156
Kansas, Oklahoma & Gulf	Feb.	327	378	....	379	479	44	58	7	33	34	11	27	100	222	248	58.7	51.7	157	67	56	96
	2 mos.	327	723	....	725	925	90	112	14	57	77	23	56	207	449	517	61.9	56.0	276	119	89	163
Lake Superior & Ishpeming	Feb.	149	44	....	49	41	39	54	10	67	67	16	2	53	172	177	352.5	437.0	—124	28	—133	—151
	2 mos.	149	88	....	97	85	85	104	19	131	134	33	4	97	341	340	351.2	399.2	—244	56	—267	—283
Lehigh & Hudson River	Feb.	96	255	....	256	255	31	35	2	27	29	8	15	81	166	175	64.9	68.6	90	37	29	24
	2 mos.	96	516	....	516	528	66	71	5	57	63	17	30	171	348	361	67.4	68.3	168	63	52	51
Lehigh & New England	Feb.	180	475	....	479	512	67	72	6	161	137	40	15	174	457	439	95.5	85.8	22	45	38	71
	2 mos.	180	905	....	913	1,051	135	150	13	312	285	79	30	341	910	931	99.6	88.5	4	72	56	141
Lehigh Valley	Feb.	1,154	4,478	272	5,016	4,962	657	753	92	894	826	204	136	2,298	4,229	4,183	84.3	84.3	787	316	302	220
	2 mos.	1,154	9,180	564	10,291	10,169	1,305	1,512	188	1,852	1,824	408	278	4,726	8,656	8,807	84.1	86.6	1,635	638	646	234
Long Island	Feb.	360	985	3,265	4,487	3,930	587	641	87	831	856	124	14	2,371	3,998	3,949	89.1	100.5	489	306	—101	—688
	2 mos.	360	1,913	6,855	9,250	8,080	1,211	1,295	172	1,776	1,839	248	30	4,879	8,262	8,197	89.3	101.4	988	609	—198	—1,515

*Because of a strike, figures for the Georgia are not available.

Engineer's Rear View Mirror

The Type "B" Brake Pipe Flow Indicator is much like a rear view mirror—it reflects what is going on in the brake pipe of his train—ofttimes a mile and a half away.

Westinghouse Air Brake
COMPANY
AIR BRAKE DIVISION WILMERDING, PA.

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1955

Name of Road	Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1955	Total (inc. misc.) 1954	Operating Expenses: Maint. Way and Structures: Total 1955	Total 1954	Deprec. and Retirements	Maint Equipment: Total 1955	Total 1954	Deprec. and Retirements	Traffic	Transportation	Total 1955	Total 1954	Operating ratio 1955	Operating ratio 1954	Net from railway operation	Railway tax accruals	Net railway operating income 1955	Net railway operating income 1954
Louisiana & Arkansas	Feb.	753	1,943	50	2,086	2,111	214	320	23	242	280	91	72	559	1,165	1,329	55.9	62.9	921	382	464	432
	2 mos.	753	4,058	102	4,337	4,294	419	591	42	497	549	181	143	1,162	2,379	2,638	54.9	61.4	1,958	823	981	863
Louisville & Nashville	Feb.	4,733	14,200	803	16,081	16,236	2,022	2,734	226	3,129	3,673	838	358	5,442	11,600	13,077	72.1	80.5	4,481	2,508	2,739	2,050
	2 mos.	4,733	28,622	1,734	32,752	33,752	4,174	5,499	470	6,231	7,300	1,675	706	11,261	23,696	26,866	72.4	80.0	9,056	5,076	5,570	4,328
Maine Central	Feb.	944	1,831	90	2,045	2,075	393	371	27	315	385	78	18	744	1,555	1,624	76.1	78.3	490	196	181	158
	2 mos.	944	3,638	182	4,074	4,218	788	790	54	648	781	156	38	1,487	3,131	3,304	76.9	78.3	943	389	367	339
Midland Valley	Feb.	334	140	....	142	164	38	36	6	12	13	4	5	50	114	113	79.9	68.8	29	12	4	18
	2 mos.	334	296	....	303	320	76	67	12	25	29	7	10	103	234	228	77.0	71.3	70	43	2	20
Minneapolis & St. Louis	Feb.	1,397	1,449	4	1,511	1,607	262	244	29	269	262	76	98	538	1,274	1,279	84.3	79.6	237	172	64	149
	2 mos.	1,397	3,061	7	3,186	3,020	523	492	55	539	524	152	206	1,127	2,606	2,628	81.8	87.0	580	380	212	165
Minn., St. Paul & S. Ste. Marie	Feb.	3,224	2,323	53	2,503	2,268	524	518	48	538	682	123	78	1,080	2,353	2,553	94.0	112.5	149	193	—37	—444
	2 mos.	3,224	4,827	109	5,215	4,601	1,053	1,092	100	1,083	1,307	239	162	2,196	4,756	5,165	91.2	112.3	459	394	97	—917
Mississippi Central	Feb.	148	200	....	204	199	51	59	2	26	24	6	14	49	152	160	74.6	80.6	52	19	23	15
	2 mos.	148	387	....	395	403	106	122	4	53	52	12	29	106	317	327	80.4	81.1	78	26	31	31
Missouri Illinois	Feb.	172	398	....	399	317	57	79	5	71	81	28	11	113	263	283	65.8	89.5	137	73	74	21
	2 mos.	172	828	....	832	670	106	145	4	139	172	56	24	228	518	556	62.3	82.9	313	137	192	76
Missouri-Kansas-Texas Lines	Feb.	3,241	4,932	239	5,649	5,698	785	915	81	817	928	244	245	2,192	4,354	4,615	77.1	81.0	1,295	418	508	389
	2 mos.	3,241	9,756	544	11,255	11,656	1,560	1,823	169	1,673	1,912	488	495	4,550	8,890	9,535	79.0	81.8	2,365	725	901	781
Missouri Pacific	Feb.	6,919	13,862	672	16,061	17,070	2,301	3,037	286	3,275	3,167	790	470	5,989	12,650	13,906	78.8	81.5	3,411	1,060	1,728	1,271
	2 mos.	6,919	28,148	1,508	32,759	34,216	4,492	5,795	579	6,774	6,491	1,583	946	12,365	25,835	28,124	78.9	82.2	6,924	2,140	3,521	2,425
International Great Northern	Feb.	1,104	2,188	115	2,503	2,451	469	428	32	463	447	122	59	990	2,097	2,084	83.8	85.0	406	111	237	222
	2 mos.	1,104	4,459	279	5,146	5,078	979	903	88	942	925	245	122	2,052	4,331	4,341	84.2	85.6	815	225	462	442
Gulf Coast Lines	Feb.	1,723	2,916	70	3,162	3,388	621	653	46	474	511	114	95	1,043	2,372	2,472	75.0	72.9	790	149	408	474
	2 mos.	1,723	6,158	169	6,720	6,897	1,237	1,326	91	962	1,040	229	188	2,197	4,869	5,106	72.4	74.0	1,850	304	1,053	888
Monongahela	Feb.	177	400	....	403	424	62	61	16	53	52	14	1	152	275	283	68.3	66.7	128	27	—6	7
	2 mos.	177	863	....	868	911	120	119	31	110	115	27	2	314	557	594	64.2	65.3	311	53	33	36
Montour	Feb.	51	111	....	124	147	13	18	2	39	63	16	1	50	113	146	91.4	99.7	11	18	30	50
	2 mos.	51	220	....	251	325	26	38	5	82	126	33	2	100	229	304	91.2	93.5	22	47	65	105
Nash., Chatt. & St. Louis	Feb.	1,043	2,397	98	2,805	2,903	448	454	46	406	401	139	120	1,042	2,138	2,124	76.2	73.2	667	230	283	359
	2 mos.	1,043	4,748	236	5,673	5,850	876	941	91	803	793	278	239	2,167	4,336	4,399	76.4	75.2	1,337	489	661	683
New York Central	Feb.	10,710	42,156	7,374	55,767	57,154	5,681	6,888	1,007	9,365	12,498	2,308	1,054	25,027	44,452	49,658	79.7	86.9	11,315	4,907	4,384	1,006
	2 mos.	10,710	84,717	16,535	114,333	115,133	11,358	14,203	1,895	18,999	25,608	4,589	2,114	51,843	91,011	102,377	79.6	88.9	23,322	9,870	9,385	139
Pittsburgh & Lake Erie	Feb.	221	2,507	63	2,729	2,844	383	335	41	748	998	286	70	1,040	2,404	2,760	88.1	97.1	325	362	824	708
	2 mos.	221	5,135	139	5,559	5,997	781	743	83	1,449	1,989	573	147	2,050	4,849	5,591	87.2	93.2	710	909	1,765	1,512
New York, Chicago & St. Louis	Feb.	2,179	11,006	123	11,418	11,277	1,265	1,208	144	2,073	1,841	361	320	4,176	8,271	7,800	72.4	69.2	3,148	1,431	1,333	1,390
	2 mos.	2,179	22,136	274	23,051	22,889	2,577	2,577	281	4,066	3,899	721	657	8,531	16,711	16,306	72.5	71.2	6,339	2,995	2,550	2,693
New York, New Haven & Hartford	Feb.	1,769	6,373	3,662	11,392	11,885	1,369	1,425	268	1,848	1,782	442	234	5,286	9,585	9,434	84.1	79.4	1,807	283	791	583
	2 mos.	1,769	13,168	7,658	23,536	23,999	2,827	2,989	529	3,498	3,718	619	446	10,864	19,342	19,669	82.2	82.0	4,193	1,133	1,293	522
New York Connecting	Feb.	21	376	....	396	258	84	54	25	20	19	....	....	80	187	155	47.1	59.9	209	79	106	33
	2 mos.	21	706	....	748	585	163	139	50	40	39	....	....	191	403	350	53.9	59.9	345	158	145	114
New York, Ontario & Western	Feb.	541	428	....	436	476	104	99	28	91	92	22	24	238	487	482	111.5	101.2	—50	36	—155	—101
	2 mos.	541	843	....	860	964	200	213	46	178	193	45	49	497	984	1,013	114.5	105.1	—124	74	—336	—257
New York, Susquehanna & Western	Feb.	120	439	42	503	441	53	49	15	60	54	13	8	205	354	344	70.3	78.0	150	39	55	20
	2 mos.	120	901	87	1,031	873	106	102	11	120	126	26	16	423	719	712	69.7	81.6	312	98	105	3
Norfolk & Western	Feb.	2,133	13,268	221	14,157	12,052	2,078	2,142	314	3,053	3,057	687	336	4,578	10,671	10,508	75.4	87.2	3,487	2,344	1,895	834
	2 mos.	2,133	26,902	511	28,738	25,768	4,270	4,410	618	6,222	6,562	1,375	648	9,237	21,624	22,036	75.2	85.5	7,114	4,846	3,883	2,067
Norfolk Southern	Feb.	605	744	....	756	789	156	163	13	119	102	28	46	225	603	618	79.7	78.4	153	84	36	53
	2 mos.	605	1,499	....	1,525	1,522	318	324	26	232	204	56	96	470	1,225	1,240	80.3	81.5	300	155	81	79
Northern Pacific	Feb.	6,866	11,031	502	12,405	11,425	1,685	1,716	257	2,476	2,692	512	317	5,546	10,739	10,718	86.6	93.8	1,665	1,334	713	—220
	2 mos.	6,866	22,380	1,028	25,245	22,682	3,240	3,821	519	5,117	5,721	1,017	653	11,350	21,863	22,914	86.6	101.0	3,382	2,661	1,287	—1,989
Northwestern Pacific	Feb.	331	1,025	3	1,050	928	268	295	18	68	89	4	6	327	693	728	66.0	78.4	357	142	78	—15
	2 mos.	331	2,087	6	2,138	1,761	520	668	36	172	172	8	11	654	1,403	1,538	65.6	87.4	735	280	162	—193
Oklahoma City, Ada, Atoka	Feb.	132	81	....	82	163	16	18	2	1	1	....	2	17	39	44	47.6	26.8	43	16	14	54
	2 mos.	132	157	....	159	253	31	32	5	2	4	....	4	34	79	91	49.8	36.0	80	31	24	67
Pennsylvania	Feb.	10,037	50,477	9,429	66,769	65,511	7,337	8,836	1,435	13,553	15,099	2,923	1,190	30,448	55,859	59,449	83.7	90.7	10,910	4,429	4,200	—1,154
	2 mos.	10,037	101,576	20,906	136,348	137,803	14,733	17,861	2,829	27,164	31,551	5,852	2,428	62,473	113,500	123,563	83.2	89.7	22,848	9,428	8,743	—751
Pennsylvania-Reading Seashore Lines	Feb.	358	527	82	630	627	173	191	24	104	98	22	9	423	739	794	117.4	126.7	—109	61	—293	—424
	2 mos.	358	1,034	168	1,241	1,277	361	415	49	207	209	44	19	863	1,511	1,683	121.8	131.8	—270	123	—653	—940

BENDIX CRC GIVES A RAILROAD ITS OWN RADIO NETWORK!

Instant voice contact in spite of storms, terrain or distance . . . with every section of the railroad system.

End to end . . . train to train . . . engineer to conductor . . . car checking . . . signal maintenance . . . mobile units . . . marine service . . . B & B construction . . . wayside stations (attended or unattended)

Proved Efficiency . . . Proved Economy and . . . Proved Safety! These are the big three factors why railroad management is looking with enthusiasm to the Bendix* system of Centralized Radio Communications.

What CRC does

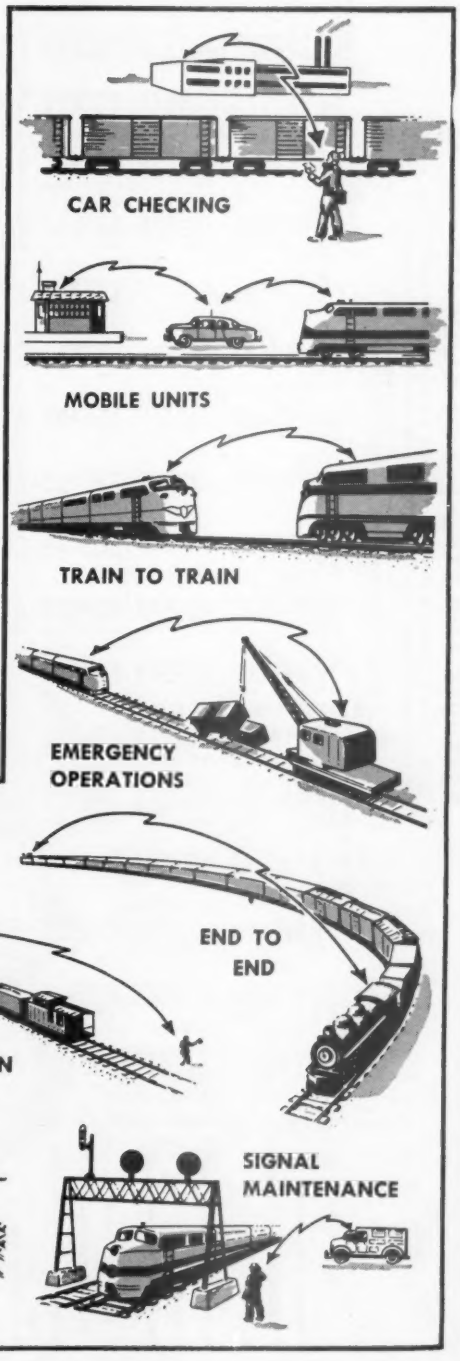
CRC means faster movement of freight. Greater protection for rolling stock. Less damage to freight in transit. Less duplication of paper work. Single tracks carry more freight faster . . . both ways.

Freight classification is speeded up. Better "meets" are made possible. Breakdowns and emergencies get immediate attention. Delays at interlocking plants are eliminated. Entering and departing yard time is speeded up.

Complete line VHF equipment

Today, Bendix, the pioneer in two-way railroad radio, offers you a complete communications system . . . from the receiver and transmitter on a diesel that can save up to $200 per diesel installation . . . to line worker paksets with more power per pound . . . to 2-way radio control in materials handling on a platform.

Have your communications engineer write to "CRC" Bendix Radio, Baltimore 4, Maryland for further proof of savings on capital investment.



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Bendix Radio — Bendix AVIATION CORPORATION

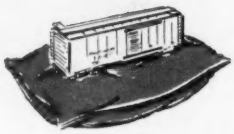
REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

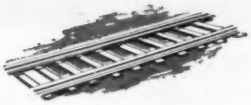
MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1955

Name of Road		Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (in c. misc.) 1944	Total (in c. misc.) 1954	Operating Expenses: Maint. Way and Structures: Total 1955	Total 1954	Deprec. and Retirements	Maint. Equipment: Total 1955	Total 1954	Deprec. and Retirements	Traffic	Transportation	Total 1954	Total 1955	Operating ratio 1955	Operating ratio 1954	Net from railway operation	Railway tax accruals	Net railway operating income 1955	Net railway operating income 1954
Pittsburg & Shawmut	Feb.	97	136	....	137	169	25	30	4	42	43	12	4	34	114	125	83.3	73.9	23	4	49	74
	2 mos.	97	281	....	283	349	55	53	7	90	86	24	8	71	244	249	86.4	71.4	39	9	98	156
Pittsburgh & West Virginia	Feb.	132	583	....	587	550	99	84	25	107	109	36	61	153	458	447	78.1	81.3	129	51	82	82
	2 mos.	132	1,183	....	1,191	1,185	204	174	48	226	233	72	120	324	956	930	80.3	78.5	235	85	149	187
Reading	Feb.	1,305	7,795	544	8,925	9,143	1,122	993	184	1,690	1,681	426	154	3,676	7,074	6,857	79.3	75.0	1,851	583	1,104	1,158
	2 mos.	1,305	15,892	1,128	18,330	18,981	2,157	2,312	369	3,470	3,510	852	317	7,449	14,267	14,472	77.8	76.2	4,062	1,348	2,243	2,352
Richmond, Fredericksburg & Potomac	Feb.	118	1,344	474	2,096	2,138	294	281	23	355	309	67	20	746	1,550	1,456	73.9	68.1	546	252	134	247
	2 mos.	118	2,779	1,029	4,383	4,480	604	593	52	669	642	133	41	1,508	3,109	3,060	70.9	68.3	1,274	603	359	509
Rutland	Feb.	392	330	....	362	352	78	81	6	61	55	13	22	144	330	340	91.2	96.4	32	25	—18	—41
	2 mos.	392	680	....	750	714	170	141	24	109	124	25	45	298	670	683	89.3	95.7	80	49	—14	—70
Sacramento Northern	Feb.	267	171	....	179	221	55	64	4	16	16	3	2	58	142	160	79.6	72.7	36	15	3	25
	2 mos.	267	338	....	355	405	126	146	8	33	27	6	5	130	322	337	90.7	83.2	33	29	—31	....
St. Louis-San Francisco	Feb.	4,601	8,026	355	9,058	9,192	1,330	1,536	153	1,525	1,599	527	347	3,329	7,025	7,446	77.6	81.0	2,033	916	996	637
	2 mos.	4,601	16,107	817	18,308	19,152	2,703	3,061	312	3,298	3,274	1,054	698	6,963	14,682	15,438	80.2	80.6	3,626	1,609	1,825	1,375
St. Louis-San Francisco & Texas	Feb.	157	373	7	402	385	39	42	4	35	33	1	26	146	256	262	63.8	67.9	146	60	43	35
	2 mos.	157	737	11	792	745	80	83	9	60	61	2	53	301	515	536	65.1	72.0	276	108	86	59
St. Louis Southwestern Lines	Feb.	1,561	4,699	15	4,873	4,966	618	706	60	567	660	104	173	1,437	2,953	3,186	60.6	64.1	1,920	806	762	652
	2 mos.	1,561	9,190	31	9,535	9,922	1,243	1,449	121	1,139	1,355	207	347	2,956	6,004	6,459	63.0	65.1	3,531	1,492	1,394	—507
Seaboard Air Line	Feb.	4,064	10,865	1,051	12,930	12,793	2,101	2,093	191	2,244	2,208	545	361	4,018	9,224	9,188	71.3	71.8	3,706	1,308	2,073	1,945
	2 mos.	4,064	22,073	2,248	26,443	26,055	4,217	4,179	382	4,567	4,470	1,084	732	8,330	18,878	18,734	71.4	71.9	7,566	2,757	4,200	3,939
Southern Railway	Feb.	6,289	17,451	1,110	20,081	19,003	2,605	2,864	230	3,412	4,021	759	407	6,323	13,586	14,414	67.7	75.9	6,495	3,014	2,938	2,237
	2 mos.	6,289	35,858	2,620	41,663	39,447	5,343	5,882	450	7,044	8,049	1,526	817	12,971	27,933	29,696	67.1	75.3	13,729	6,430	6,272	4,668
Alabama Great Southern	Feb.	326	1,202	55	1,383	1,499	207	222	31	270	276	57	33	431	1,010	1,018	73.1	67.9	373	113	215	230
	2 mos.	326	2,330	118	2,701	2,931	424	454	61	550	583	115	65	880	2,067	2,084	76.5	71.1	634	207	335	410
Cinn., New Orleans & Texas Pacific	Feb.	337	2,891	163	3,246	3,468	483	463	42	513	625	133	68	817	2,033	2,170	62.6	62.6	1,214	604	557	575
	2 mos.	337	5,901	353	6,653	6,727	972	927	85	1,157	1,390	267	140	1,625	4,189	4,513	63.0	67.1	2,464	1,222	1,090	978
Georgia Southern & Florida	Feb.	475	649	82	802	731	266	177	9	70	55	7	20	250	650	548	81.1	75.1	152	42	—46	—51
	2 mos.	475	1,339	173	1,667	1,524	518	372	17	142	131	14	39	530	1,317	1,151	79.0	75.6	350	86	—98	—112
New Orleans & Northeastern	Feb.	204	772	42	864	965	146	131	19	121	133	42	20	201	537	543	62.1	56.3	327	193	140	166
	2 mos.	204	1,453	86	1,642	1,960	322	278	37	262	279	85	40	418	1,150	1,102	70.0	56.2	492	309	192	327
Southern Pacific	Feb.	8,130	32,726	2,293	37,179	35,803	4,693	4,587	461	7,928	7,923	1,895	851	14,145	29,617	29,342	79.7	82.0	7,562	3,455	3,614	2,898
	2 mos.	8,130	65,039	5,125	74,844	71,469	9,463	9,166	925	16,019	15,795	3,783	1,688	29,703	60,877	60,259	81.3	84.3	13,967	6,406	6,513	4,390
Texas & New Orleans	Feb.	4,315	9,033	431	10,075	10,383	1,748	1,750	134	1,372	1,453	146	257	3,668	7,644	7,771	75.9	74.8	2,431	924	552	267
	2 mos.	4,315	18,260	910	20,387	21,640	3,584	3,556	270	2,809	3,010	295	539	7,498	15,573	16,073	76.4	74.3	4,815	1,797	980	1,501
Spokane International	Feb.	150	275	....	286	234	51	49	2	24	25	10	6	63	157	150	54.8	64.1	129	47	58	47
	2 mos.	150	511	....	533	431	101	97	5	50	47	19	12	128	314	300	58.8	69.6	220	83	93	62
Spokane, Portland & Seattle	Feb.	944	2,169	60	2,365	2,112	363	316	48	368	326	110	29	747	1,603	1,501	67.8	71.1	762	591	114	396
	2 mos.	944	4,435	151	4,849	4,191	713	682	97	770	690	220	60	1,568	3,297	3,228	68.0	77.0	1,552	781	650	545
Tennessee Central	Feb.	286	345	....	355	361	62	65	5	57	58	19	15	120	279	281	78.7	77.9	75	25	10	22
	2 mos.	286	719	1	741	751	128	135	11	116	118	41	30	247	571	580	77.1	77.3	169	51	35	48
Texas & Northern	Feb.	8	99	....	112	78	3	4	....	9	10	3	1	6	24	30	21.4	38.8	88	1	68	13
	2 mos.	8	219	....	248	171	7	9	1	17	19	6	2	13	49	60	19.9	35.1	199	3	143	31
Texas & Pacific	Feb.	1,831	5,562	264	6,319	6,293	988	1,018	86	907	1,174	247	191	2,032	4,469	4,828	70.7	76.7	1,850	613	745	581
	2 mos.	1,831	11,395	631	13,047	12,936	1,930	2,059	175	1,884	2,291	493	383	4,298	9,193	9,764	70.5	75.5	3,854	1,257	1,619	1,371
Texas Mexican	Feb.	161	206	....	222	222	46	54	5	25	27	10	9	60	159	168	71.6	75.4	63	26	15	17
	2 mos.	161	421	....	455	437	93	111	11	53	55	20	19	125	326	342	71.7	78.2	129	56	32	18
Toledo, Peoria & Western	Feb.	239	494	....	502	580	65	101	6	50	60	11	43	130	333	368	66.4	63.5	169	76	51	69
	2 mos.	239	1,003	....	1,019	1,183	128	209	14	106	100	23	83	259	659	718	64.7	60.7	360	157	105	154
Union Pacific	Feb.	9,813	30,868	1,820	35,255	34,753	4,693	3,800	427	7,365	7,011	1,620	911	12,484	27,363	27,402	77.6	78.8	7,892	4,552	2,161	1,475
	2 mos.	9,813	62,995	4,063	72,301	71,824	9,660	8,039	867	14,919	14,917	3,226	2,118	26,026	56,720	57,547	78.4	80.1	15,581	8,942	3,978	2,455
Utah	Feb.	99	111	....	111	67	13	18	2	31	44	8	1	35	88	101	79.8	149.4	22	9	15	—44
	2 mos.	99	228	....	228	166	28	34	4	65	89	17	2	73	184	207	80.4	125.0	45	17	34	—56
Virginian	Feb.	611	2,959	1	3,089	2,802	407	440	61	710	724	207	46	672	1,929	2,003	62.4	71.5	1,160	629	642	460
	2 mos.	611	6,345	2	6,591	5,941	808	866	122	1,420	1,451	406	97	1,397	3,909	4,085	59.3	68.8	2,681	1,462	1,457	1,066
Wabash	Feb.	2,393	7,605	369	8,692	8,955	1,014	1,053	103	1,202	1,436	362	308	3,696	6,608	6,819	76.0	76.1	2,085	711	830	751
	2 mos.	2,393	15,307	783	17,474	18,008	2,041	2,155	205	2,463	2,954	724	610	7,485	13,393	13,977	76.6	77.6	4,081	1,374	1,627	1,361
Ann Arbor	Feb.	294	653	....	658	665	72	79	6	127	129	30	28	314	555	576	84.3	86.7	103	44	32	33
	2 mos.	294	1,310	....	1,323	1,276	140	153	14	261	265	60	56	644	1,136	1,152	85.8	90.2	188	89	52	39
Western Maryland	Feb.	847	3,113	3	3,323	3,299	484	477	48	592	646	203	100	1,061	2,445	2,500	73.6	75.8	877	404	588	580
	2 mos.	847	6,608	6	6,705	6,976	978	1,009	97	1,202	1,347	406	200	2,171	4,978	5,230	74.2	75.0	1,727	775	1,142	1,221
Western Pacific	Feb.	1,193	3,441	141	3,653	3,521	646	653	77	607	578	178	187	1,186	2,859	2,866	78.3	81.4	794	262	505	316
	2 mos.	1,193	6,748	295	7,189	7,131	1,263	1,297	164	1,218	1,247	357	406	2,487	5,872	5,891	81.7	82.6	1,317	510	761	570
Wisconsin Central	Feb.	1,042	2,043	22	2,182	2,077	282	309	37	350	429	85	69	926	1,742	1,852	79.8	89.2	440	148	137	—14
	2 mos.	1,042	4,173	53	4,474	4,192	545	655	76	710	879	170	142	1,903	3,522	3,819	78.7	91.1	952	297	360	—143

in NATIONAL C-1 trucks VALUE is a lot of things



CUSHIONED RIDE
Constant pressure of the friction wedges against the bolster develops friction resistance to control vertical and lateral shocks.



LESS POUNDING OF ROADBED
Because the National C-1 truck smothers vertical and lateral shocks there is less pounding on the roadbed.

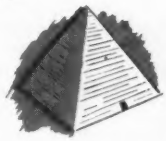
LESS MAINTENANCE
Maintenance costs are reduced because National C-1 trucks give a ride that prolongs the wear life of car, wheels, journals, bearings and roadbed.

Lading rides better on National C-1 trucks because they have an efficient constant-friction control mechanism that materially reduces vertical and lateral shocks.

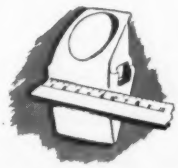
The superior riding qualities of the National C-1 trucks have been proven in AAR comparative tests and further substantiated in service.

For *low maintenance* and *satisfied shippers* equip with National C-1 trucks.

AA-484



LONG WEARING PARTS
Friction wedges, low-stressed wedge springs and hardened spring-steel wear plates are designed to last the life of the car.



FULL-WIDTH BEARING
The convex surface of the friction wedge has full-width bearing against the side frame pocket—for minimum wear.

GOOD LID FIT
Lid faces are jig-ground for smooth surface and for alignment of hinge lug and face; hinge lugs can be furnished with steel bushing and hardened steel wear plate for long life.

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY
Cleveland 6, Ohio

COUPLERS • YOKES • DRAFT GEARS • FREIGHT TRUCKS • SNUBBER PACKAGES • JOURNAL BOXES and LIDS

What's New in Products

16mm Desk-Top Microfilmer

Lower cost microfilming for a wide variety of business documents, from file cards to large ledger forms, is said to be possible with the new Recordak Reliant microfilmer. An automatic feeder can handle over 400 items a minute. New design features in the precision-built feeder, the manufacturer says, prevent "double-feeding" of documents and assure "errorless" microfilming over long periods of operation. *Recordak Corporation (subsidiary of Eastman Kodak Company), Rochester 4, N. Y.* •

A two-cell Type EH battery with a section of the container cut away to show internal construction.

Battery Capacities Increased

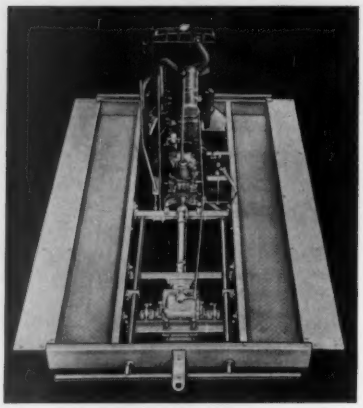
New Exide Type EH car lighting and air conditioning batteries are said to deliver full rated power initially and throughout a longer working life than similar batteries made previously by this company. The capacity increase is obtained by an increased length of plate. This is made possible by the performance of the Ironclad type positive plate. Long service showed that sediment deposits were so small that in the same sized containers there was room for longer plates. The positive plates have been balanced with new "stable-voltage" negative plates to insure delivery of full capacity throughout the life of the battery.

Grids of the EH batteries are cast of Silvium, a silver-lead alloy developed by Exide engineers. The manufacturer states that by cutting down wear of the positive grid spines, the use of the alloy reduces power losses and charging time and also adds to the life of the battery.

Finely slotted, acid-proof polyethylene tubes retain the active material in contact with the grid spines and permit it to be freely penetrated by the electrolyte. Tube sealers of the same material are attached to the bottom of the tubes, firmly sealing the active material. This technique is said to prevent short circuits and lengthen service life.

The containers are made of a tough, durable hard rubber and have been designed with extra thickness for protection at points of greatest strain. End and side walls are ribbed to withstand shock and vibration encountered in railway service.

The batteries are available in two-, three-, and four-cell trays in capacities ranging from 268 to 1,320 amp-hr. *Exide Industrial Division, Electric Storage Battery Company, Philadelphia, 3* •



Heavy-Duty Motor Car

A new heavy duty motor car, the Kalamazooo 27AW-G, has been announced. Available with either a Ford water-cooled engine or a Wisconsin air-cooled engine, the new unit has a selective speed transmission with an automotive-type drive shaft which allows four equal speeds in either direction. All four axle bearing assemblies are spring mounted to provide a more comfortable ride, absorb rail shock and thereby give longer life to the car. The unit is equipped with a Kalamazoo enclosed gear rear-axle drive assembly. *Kalamazoo Manufacturing Company, Kalamazoo, Mich.* •

Retarder for Bumping Posts

Designed to fit almost all bumping posts now in service is an attachable head for absorbing impact of couplers. This device, known as the Hayco Retarder Head, is reported to make any bumping post a retarder by eliminating the sharp metal-to-metal contact between coupler knuckles and the post. The retarder head consists of eight AAR specification springs, nested in pairs and seated on a 5½-in. thick Fabreeka pad which has a reported break-point of 10,000 psi. The spring nests are of Shelby tubing. The head is of welded plate and bar construction.

It is said that the head can be installed by two men with a track wrench in about 30 min. It weighs 225 lb. *Brice Hayes Company, Chicago* •

Timken bearing shown marked "OK" after 400,000-mile test run on New York Central car #2902.

New S/V Grease Albrex No. 1 now approved by A.A.R. for use in all journal bearings!

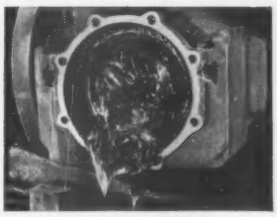
There's a "long" story behind the OK on that journal bearing, above—a story that started five years ago in a Socony-Vacuum laboratory. That's when we first began work on *S/V Grease Albrex No. 1*—our new journal bearing grease for locomotives and passenger and freight cars.

We spent 2½ years developing and testing *S/V Grease Albrex No. 1* in the laboratory—then asked the New York Central to road-test it. They placed it in the journal bearings on car #2902—ran this car another 2½ years for a total distance of over 400,000 miles!

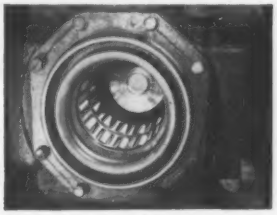
At the end of this run, bearings and grease were examined. There were no signs of wear or rust in the bearings. There was virtually no deterioration of the grease. As the result of these findings, *S/V Grease Albrex No. 1* received A.A.R. approval.

Now, *S/V Grease Albrex No. 1* is available to you with all these proved advantages . . . 1) stability for *exceptionally long-service life*—for big savings in time, trouble and money . . . 2) *unexcelled protection against rust*—particularly valuable for operators of refrigerator cars . . . 3) *guaranteed uniformity*—inherent in the Socony-Vacuum trade mark.

For complete details call your local Socony-Vacuum representative.



SKF bearing shown about to be examined after record run. Note "barrel-new" condition of *S/V Grease Albrex No. 1.*



Hyatt bearing after grease was removed. No sign of wear or rust on rollers or other bearing parts.

Socony-Vacuum Oil Co., Inc.

RAILROAD DIVISION

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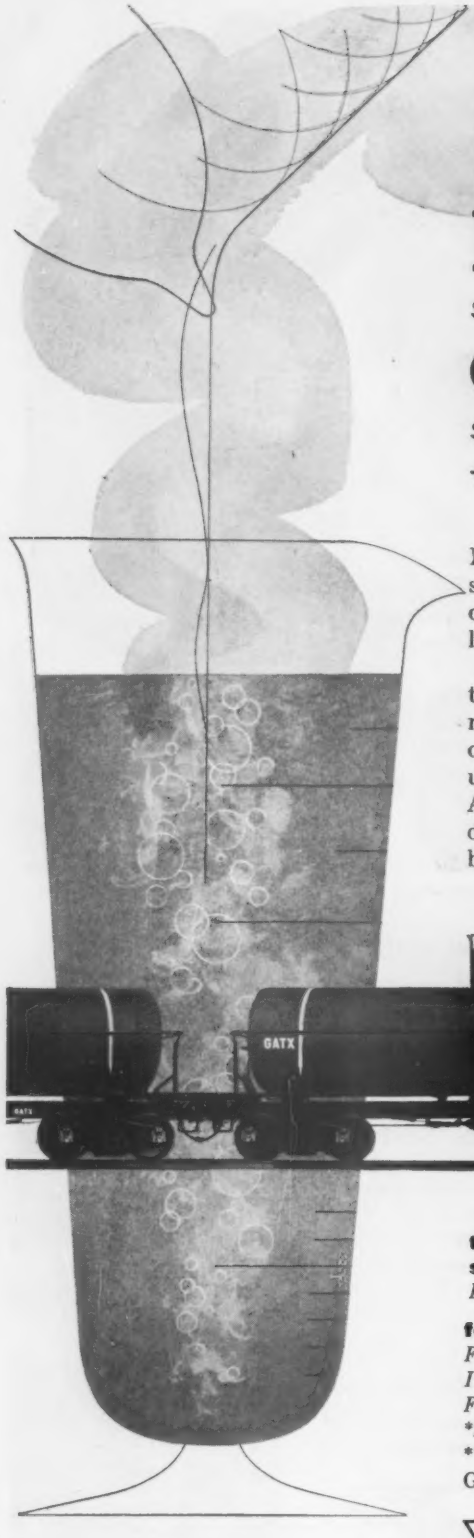
Railroad Lubricants



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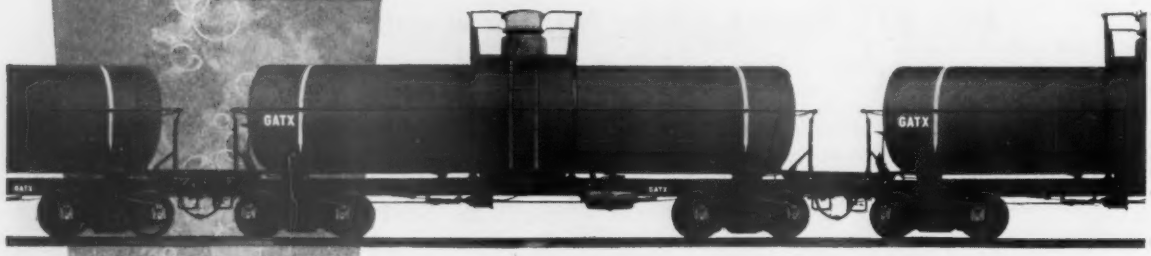

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What About the "Cabinet Report"?

For the better part of a year now the railroad industry has been almost completely inactive in the public discussion of important questions of government relations to transportation — all in deference to an expected report on desirable transportation reforms by a special Cabinet committee.

"Hope deferred maketh the heart sick."

The longer the estimable gentlemen of the Cabinet committee keep kicking this thing around, the less likely it probably is that they are going to come out with anything of realistic value. Our belief, shared by a lot of railroad men, is that the railroads and their friends had better consider starting to talk again. With all due respect to the Cabinet committee—isn't it, after all, rather optimistic to expect that gentlemen whose primary concerns are and must be political are going to rise above the customary caution of their craft in handling so controversial an issue?

There is a risk in expressing such an opinion — because some miricle *could* happen, and a commendable report *could* issue from the Cabinet committee while these words are being printed. We don't mind the risk; nothing could make us happier than to be made to appear ridiculous by having the Cabinet committee now come up with a realistic performance which we've reluctantly ceased to expect from it.

There have been several "leaks" in the daily and general news press as to the likely content of this Cabinet committee report—a recent rather detailed one having been published in the Wall Street Journal of March 28. Some months ago the magazine U.S. News and World Report made some predictions as to the report's likely content, and we published the educated speculations of our Washington editor, Walter Taft, on this subject in our Review & Outlook (January 10) issue.

Practically all of these optimistic "leaks" and predictions appear to have one common property —that is, they seem to have been based on the recommendations of the so-called "Page committee," rather than on anything the Cabinet committee itself seems likely to be able to agree on. The Page committee—headed by Arthur W. Page, retired vice-president of the Bell Telephone System—served as the "task force" for the Cabinet committee. We have never seen the "task force" report but, from our personal knowledge of the ability and public spirit of its members, we'd almost be willing to accept recommendations from such people sight unseen.

The report, as the "leaks" have had it (but which, we suspect, refers to the work of the Page committee rather than the Cabinet committee), favors such things as curtailment of ICC authority over minimum and maximum rates, freedom of entry by railroads into other kinds of transportation, terminating the long-and-short haul clause, application of tolls on inland waterways, a stop to "trip leasing," and several other proposals in similar vein. Most of these recommendations, in one form or another, have long been urged by the railroads—except, perhaps, that the Page committee has apparently been willing to concede to the railroads even more freedom in rate-making than some of them want.

So what should the railroads do now? Continue holding their peace—while persisting in the hope that the Cabinet committee is going to recommend reforms in their (and the public's) behalf that the railroads themselves are too modest to promote enthusiastically?

There is a growing belief among railroad men that the railroads ought to renew and intensify their educational efforts in behalf of most or all of the objectives believed to have been recommended to the Cabinet committee by the Page committee. As far as the Cabinet committee report is concerned, three things may happen: (1) the report may not come out at all; (2) it may come out in such "watered down" form that it will have little value; or, miraculously, (3) the report *may* come out incorporating the major recommendations of the Page committee.

No matter which one of the three possibilities as regards the Cabinet committee report is the actual outcome — vigorous educational effort by the railroads, beginning at once, should be helpful and not harmful. Cabinet committee report or no Cabinet committee report, legislative reforms in the transportation situation will require congressional action. Congressional action will require "grass roots" support. And the "grass roots" won't ask for things they don't know about.

Another thought—have the railroads always realized to the full the educational advantages possible from ICC hearings on competitive transportation issues? In other words, do the railroads always put into these cases the most thorough presentation of the facts that is possible?

How the NYC Steps Up Tempo Of Management

Technique provides new educational tools for officer team and blueprints more effective organization

By ALFRED E. PERLMAN
President, New York Central

The New York Central has taken the initial steps in what we expect to develop into a comprehensive program of improved organization; with increased care in the selection of employees, and with intensive attention to the development of supervisory and managerial skills.

It is our belief that progress in improved organization, and in the development of the highest attainable proficiency in management, is a matter of the utmost urgency. Management of equal ability to that of other industry is not enough for the railroads. On the railroads, managements have to solve all the problems common to those of other industry—and a great many more besides, arising from the much greater intrusion of government in railroading than in any other business.

What Goes into Good Management?

Efficiency of management is usually dependent upon a combination of factors—among them (1) selection of the best available men from the standpoint of aptitude and training, (2) adequate education and experience on the job, and (3) a kind of organization calculated to get the maximum use of the abilities of the men composing it.

A well developed and clarified organization structure is of fundamental importance for the same reason that you can't afford to waste a 6,000-hp locomotive pulling 3-car trains, or assign one 1,000 hp unit to 150 loaded cars on a heavy grade. Good organization helps put the best man available in the place he is best fitted to fill—and it leaves no important spots inadequately manned. And relationships between individuals are established to assure their functioning as an effective team.

The railroad industry was a pioneer in the study of problems of organization of large industry—but in recent years other industries have carried research and development in this area much further than the railroads have. As a first step toward getting our officer personnel to thinking along these lines, we reprinted as a pamphlet, "Chapter III—Organization, Field and Staff" from L. F. Loree's "Railroad Freight Transportation"; and we have made a wide distribution of this pamphlet among our officers.*

There have been many revolutionary changes in railroading since Loree wrote this classic work, but the basic principles of organization remain unchanged. In any event, there is a dearth of recent useful literature on the subject from the railroad industry—although it exists in great plenty for other industries.

Early in January of this year we had a three-day session of 37 of our chief officers at the Greenbrier at White Sulphur Springs, W.Va.—to get them away from their regular work and not easily accessible by telephone. Those in attendance were invited to bring their wives, since one purpose of the meeting was closer acquaintance—an important objective on such a far-flung system as the New York Central, where many of our people see each other infrequently unless such meetings are specifically planned.

The primary purpose of our 3-day conference, however, was to initiate our study of organization—a task in which it is necessary that all top managerial personnel participate.

They are the ones who will have to live and work with the plan that finally evolves—it is essential that they participate in developing the plan, and know its workings thoroughly.

All large organizations with specialized departments tend to form a habit of referring many detailed questions to headquarters for decisions—questions which could be dealt with more intelligently and far more promptly by

*This reproduction was made by arrangement with the publisher. Loree's famous book, first published in 1922, has long been out of print.

officers "on the ground." Headquarters has its necessary function—but this function is not that of handling a lot of details by the "hair-pin turn" route, all the way from the bottom to the top of the organization and back again.

Every department and every officer must know what the objectives of the company are—and what his own duties are and how they relate to the work of others, in achieving the company's objectives. We must get an organization which will decentralize authority and responsibility, while not losing any of the advantages which central control of policy and check on performance can achieve. At our Greenbrier conference we had an expert on organization from the American Management Association outline for us the principles of sound organization—because, fundamentally, these principles are exactly the same for the railroads as for all other industry.

We have at present 24 of our officers enrolled in management courses conducted by the American Management Association. These courses are divided into four "units" of one week each—and may be taken intermittently one week at a time over a period of a year. These courses comprise an intensive review of the entire range of modern managerial principles and practices, with extensive use of case histories. It is intended that about 100 of our top officers should take these courses, from the position of division superintendent up to the top of the organization. (The chairman and president of the company have each taken a special AMA one-week course, which is limited to heads of companies.)

The AMA has other educational facilities besides its formal courses—frequent seminars, conferences, and other meetings; and a wealth of high-quality current literature, of which our officers are making full use.

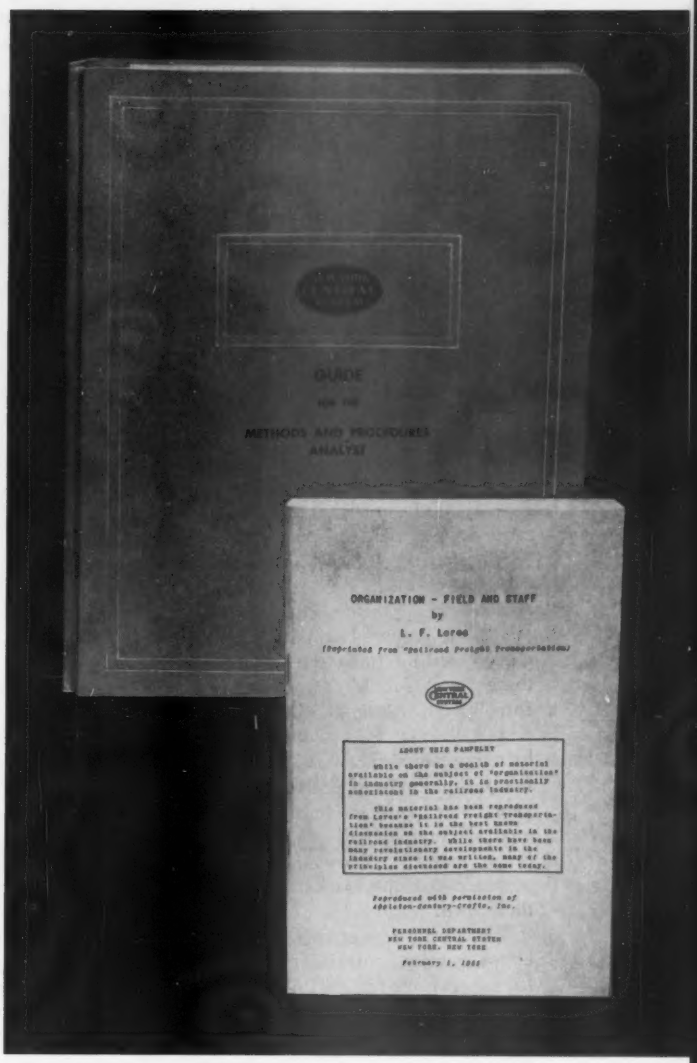
The New York Central management also has, regularly, at least one of its officers at the annual four-weeks' courses in transportation at American University in Washington; and many of our top officers have participated in the three-month Advanced Management Program at Harvard Business School. One of our officers (H. L. Porter, assistant comptroller) is at Harvard now.

We are sure that these formal educational efforts—combined with steady improvement in the form of our organization—will improve, and quickly, our management performance. It is like giving a good mechanic the best set of tools there is for the kind of work he is doing.

Getting Better Acquainted

But our program goes farther than this. We also want to make sure that management at every level has full information at all times of the capacities of all people in supervisory positions. To make this information readily available, we are getting a complete personnel record on each officer and supervisor. This information is divided into two parts: (1) unchanging historical data (date and place of birth, parentage, schooling, etc.); and (2) variable data (family status, willingness to move, jobs held, recent education and experience). For purposes of easy filing, this information is assembled on one sheet with a photograph of the man—and photostat copies are made to be kept on file wherever it is likely that the information may be useful.

Any employee promoted from the ranks into a managerial position will henceforth appear in these files. As



The author says there is a dearth of recent literature from the railroads about basic principles of organization.

time goes on personal record files will be constantly enlarged, since a new employment procedure now in force in our central offices (later to be extended system-wide) will give us much more complete information on all new employees than we have had heretofore.

This employment procedure involves a new interview card for initial screening and the stockpiling of applicants, a new application form, and a simple test of the applicant's mental ability. Previous employers are contacted by mail, using a new form especially designed for this purpose—and no employee is permanently accepted as such until he has undergone a period of probation. There must be a favorable appraisal by the immediate superior of the probationary employee—on such matters as willingness to work hard, cooperativeness and attitude, dependability, ability to get along with fellow workers, safety habits, etc.—and a definite decision made approving or rejecting the employee during the probationary period.

This greater care in employment should, in time, yield

favorable results—not only in the rank-and-file of employees—but also in the reservoir from which, of course, most supervisors are selected.

One of the principal problems in the management of any large organization is the coordination of departmental activities. If an officer has experience in only one department, it is mighty difficult for him to be a capable judge or supervisor of the work of another department. To give our people who, we believe, may have managerial ability some valuable experience in the work of other departments one most effective device is our "task force" —or "junior jets," as the same technique was popularly labeled on the Rio Grande.

These "task forces" are assigned to give intensive study to the operations of an office or department. All procedure within the department, e.g., handling of loss and damage claims, are analyzed with a definite view toward improvement. Other procedures which have been subjected to this study include the handling of time reports, material reports, pension records, personal injury claims, recording of contracts, purchase invoices, and purchase requisitions.

A "task force" is usually made up of three men—one of them invariably from the department in which the study is being made, and two from other departments. We have prepared a detailed manual (73 multilithed pages) setting forth the procedures to be followed by these "task forces"; and the result is that the "task force" by a few months' work produces three highly desirable results: (1) recommended improved procedures bringing an annual saving to the company of a good many thousands of dollars; (2) three young men with valuable experience in making the kind of systematic analysis that is indispensable to a well-managed enterprise; and (3) two young men with some intensive experience and observation in some department other than their own.

Work on a few of these task force assignments is just about as effective training as a man could get, to fit him for supervisory responsibility involving other departments than that in which he has had most of his experience. Younger men who show some promise for supervisory work will be given definite experience of some duration in other departments, wherever possible. For example, a man whose entire experience has been in the transportation department and who may be under consideration for the position of superintendent could certainly do with a year's experience in the mechanical or engineering departments, or both, before he gets his superintendent's assignment.

A superintendent or a general manager needs to have an eye on all departments at his level of supervision—and there is no other way to make his eye quite so acute as for him to have actual experience in the departments likely to fall, later, under his jurisdiction.

Finally, we need to be systematic in our economic rewards for our supervisory forces—not paying one man far "above the market" and another far less. To improve our performance in this area, we have recently engaged a qualified executive to give us objective recommendations.

We have made only a start in comprehensive dealing with the greatest of all railroad problems, i.e., assuring ourselves of the managerial competence required to deal with all other railroad problems. But it is a start.

Benchmarks and Yardsticks

Guy L. Brown, head of the Brotherhood of Locomotive Engineers, recently made an eloquent plea for cooperation between the railroad unions and other elements in and around the railroads. The occasion was the March 24 annual dinner of the Federation for Railway Progress; and there was within range of Mr. Brown's voice a cross-section of all categories of people with a direct interest in the railroads— unionists, managements, investors, suppliers, shippers, the armed services, government officials.

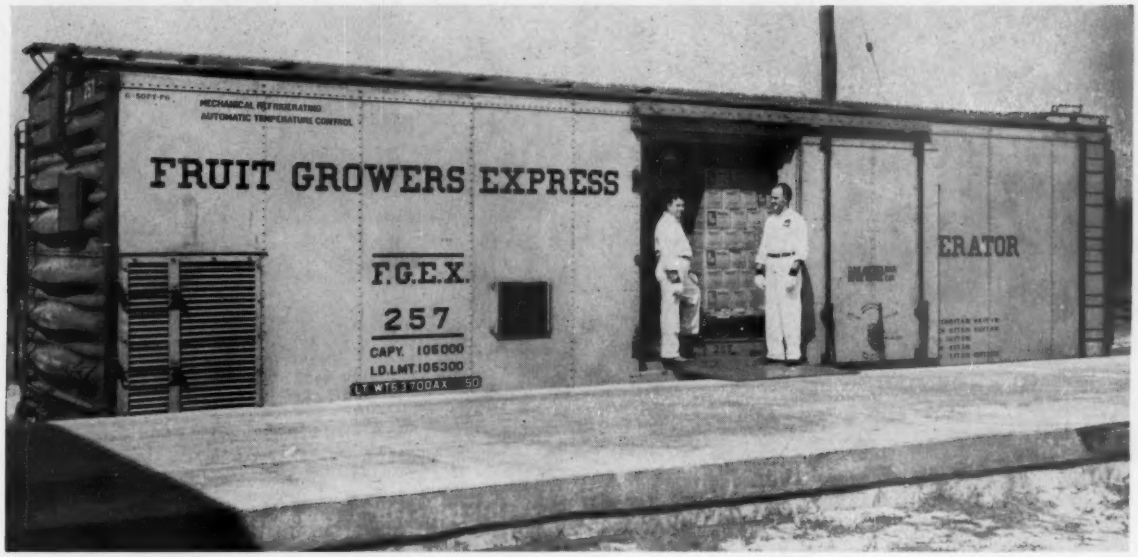
Mr. Brown's prescription was fine. All that now remains is to have the prescription filled and administered to the patient. That can happen only if all the elements concerned *will* that it happen. These elements are not likely to attain such an act of will unless they think and look around hard enough to realize the danger they are all in if they *don't* cooperate.

Consider for a moment the help that the long-haul trucking business is getting (to judge by the daily papers) from Dave Beck, head of the Teamster's union. To go by what the papers say, Beck appears to be a bigger and more influential spokesman for the trucking business than anybody on the management or ownership side. And Beck's union has more members than all of the railway unions combined. If all the railway unions were as aggressive in fighting for the growth of railroad traffic as Beck and his union have been in championing truck transportation, the chances are that there would be a lot more tonnage (and employees) on the railroads than there are now.

There seems to be no art quite so hard to learn as that of working with people on goals of common interest—and not allowing disagreement on secondary issues to stand in the way. Realization of this objective, as advocated by Mr. Brown, has been slow in coming on the railroads. Possibly the existence of so many unions is one explanation.

Actually, cooperation between railway unions, and managements and owners, could profitably (for all concerned) go a great deal further than just collaborating on common legislative objectives. Take so-called "make work" or "featherbedding." It can be demonstrated incontrovertably that such practices, in the long run, destroy jobs rather than preserve them. But unionists kept for the time being on the job by "make work" rules are human beings, hence not unduly interested in average employment or in the "long run." What they are more interested in is jobs in their own craft as of today.

Mutual determination to find solutions to such issues as this would be as helpful to all elements in and around the railroads as would their cooperation on legislative objectives. J.G.L.



LOADING frozen orange juice concentrate at Lakeland, Fla.

Mechanical Cooling Pays Its Way

Railroads move 60 per cent of frozen concentrates, to which mechanical cars are assigned—Over three-quarters of other frozen foods move by truck

OUTPUT OF COMMERCIAL FROZEN FOODS

(In millions of pounds)

Year	Fruits	Vegetables	Poultry	Meats	Seafoods	Specialties	Concentrates	Total
1938	130	73	12	5	48	....	....	268
1939	180	70	15	10	50	....	....	325
1940	225	92	50	14	50	....	....	431
1941	250	150	75	18	75	....	....	568
1942	275	220	70	12	70	0.5	....	647.5
1943	210	300	90	14	90	7	....	711
1944	315	285	90	....	90	10	....	790
1945	445	338	100	....	120	25	....	1,028
1946	540	475	125	12	125	40	....	1,317
1947	347	346	130	15	125	5	....	968
1948	377	446	150	20	150	20	....	1,163
1949	360	566	200	50	165	35	140	1,516
1950	475	590	275	75	225	60	300	2,000
1951	420	790	350	85	300	85	440	2,470
1952	420	895	400	125	350	150	550	2,890
1953	542	1,076	470	170	400	300	678	3,636
1954*	580	1,100	525	200	450	425	713	3,993

*Estimated

Courtesy of Quick Frozen Foods magazine.

By C. B. PECK
Consulting Editor, *Railway Age*

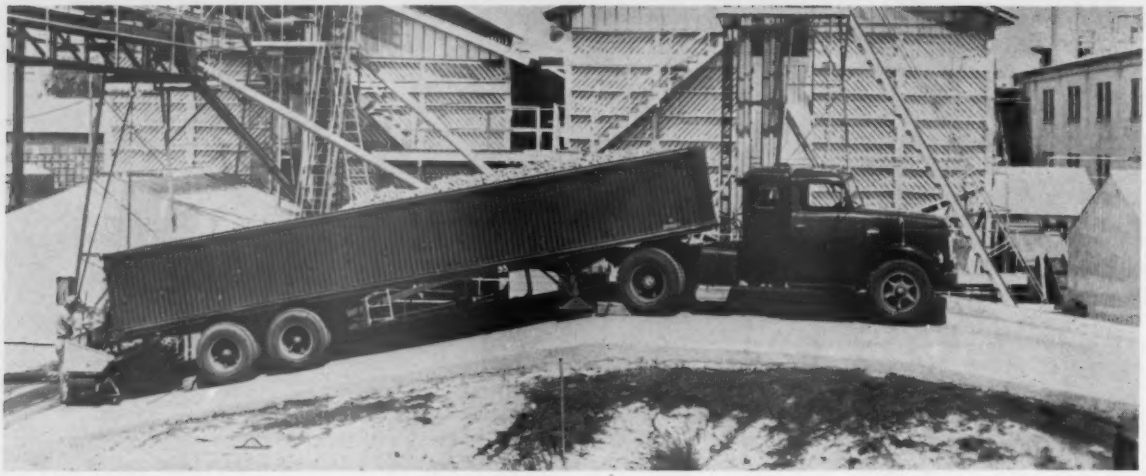
Starting from scratch about seven years ago, the manufacturers of refrigerating equipment and the private car lines have developed several practicable systems of mechanical refrigeration for railway refrigerator cars. When the building programs now under way are completed, there will be upward of 1,200 mechanical refrigerator cars in service in the United States.

The pressure behind the mechanical refrigeration development comes from the fabulous growth of the production of citrus fruit concentrates, itself a single branch of the fabulously growing frozen food industry. Beginning in 1945 and 1946, 226,000 gal of citrus concentrate were produced—mostly orange juice and practically all in Florida. By 1952 the production had increased to 47,000,000 gal; in 1953 it reached 64,000,000 gal. This year the industry anticipates a production of over 70,000,000 gal of orange concentrate.

The table on page 52 shows that Florida is still the great producer and has added a substantial amount of grapefruit juice to the orange juice and output. During the past five years California has advanced rapidly in the production of lemonade and lemon juice concentrate.

During the first few years of the Florida concentrate development the railroads handled about 83 per cent of

ONE OF SEVEN Minute Maid citrus concentrate plants in Florida.



UNLOADING fruit at a Florida citrus concentrate plant of the Minute Maid Corporation.

FISH STICKS—One of many brands of this frozen product production of which jumped from 2.2 million to 34.8 million pounds from 1953 to 1954.

the movement. By 1948, however, the industry had found that, to get a high-quality product into the hands of the consumer, temperatures should not be allowed to rise above 0 deg F and that such temperatures could not be maintained consistently in refrigerator cars cooled with water ice and salt. Mechanically refrigerated trucks began to compete for the business and the refrigerator-car proportion of the traffic began to decline.

In 1948 the Fruit Growers Express Company, and its two associates; the Burlington Refrigerator Express Company and the Western Fruit Express Company, in whose cars most of the perishable rail traffic out of Florida moves, set up an experimental program in which 16 cars were equipped with nine different refrigerating systems. These included water ice, dry ice, the split ammonia system, the Thermo-King gasoline-driven cycling system, and the Frigidaire diesel-powered continuously operated system.

Shortly after World War II the Santa Fe built an ex-

LEFT.—Field-packed lettuce enters a vacuum cooling tube in which temperatures are lowered to nearly 32 deg in about 15 min. Tight cartons reduce dehydration. Without top ice, heads are cleaner and drier. RIGHT—Tons of fresh carrots being topped, sorted, wrapped in cellophane bags and packed in fiberboard cartons in this Southern California packing plant. The bags preserve freshness. ***(Photos courtesy UFF&VA)***

perimental car, fitted with mechanical refrigeration equipment and an elaborate set of test instruments. This car made several trips with commercial loads during which test observations were made. The car was also subjected to static tests.

In 1953 Pacific Fruit Express built 25 mechanical refrigerator cars on a more or less experimental basis. This company has continued its participation in research work for the improvement of mechanical refrigeration.

When present car-building programs are completed, there will be over 1,100 mechanical refrigerator cars in frozen-food service, predominantly in citrus concentrate service.

Frozen Foods Skyrocketing

During this period the production of citrus concentrates has increased tremendously in volume. It now includes products of grapefruit and lemons as well as oranges, and has spread to Arizona and California. In 1944 about 17 per cent of the country's total orange crop and 24 per cent of the Florida crop was processed, largely in cans.

Last year about 56 per cent of the total crop and 70 per cent of the Florida crop was processed. The increase was in the frozen concentrates.

The tremendous growth in the volume of citrus concentrates since 1945 is not the only spectacular feature of the quick frozen food industry. The volume and variety of processed foods is increasing by leaps and bounds. Indeed, some observers predict that they will become the dominant product group of the frozen-food industry during the next few years. These items are being prepared and marketed from the Atlantic to the Pacific by a growing number of producers. They include fish sticks—of which 2.2 million pounds were produced in 1953 and 34.8 million pounds in 1954—French fries, beef pies, chicken pies, turkey pies, complete turkey dinners, fried oysters, frozen soups and many others.

At least one group of chain stores, in which frozen foods now account for about 10 per cent of the total food sales, anticipates that frozen foods will account for a third of total sales in less than a decade. New products in the prepared frozen-food group—baked goods, for instance—are coming into the market constantly. Frozen baked goods may soon account for a high proportion of the food store sales of baked goods.

While the development of mechanical refrigeration for railway refrigerator cars has moved fast since it started, it has not moved fast enough to protect the railroads from encroachments by refrigerated highway trucks. In the concentrate field alone have the railroads retained the major portion of the traffic, estimated at from 60 to 65 per cent.

Over 90 per cent of all cooked and prepared frozen foods were moved by truck last year, largely because the distribution by regional packers is short haul. The movement of frozen fruits and vegetables, only 37 per cent of which moved by rail in 1953, showed a gain to 40 per cent last year. This is attributed to the fact that mechanical refrigerator cars were available to a greater extent for frozen products other than citrus concentrates last year than in former years. For the industry as a whole, however, the railroads handled not more than 30 per cent of the movement.

In discussions of the relative importance of the carloadings of frozen commodities and other kinds of refrigerator-car traffic there is a tendency to base the argument on the number of refrigerator carloads which the railroads are presently handling. This represents less than a

CITRUS CONCENTRATE PRODUCTION, GAL (000)

	Orange			Lemonade	Lemon	Grapefruit
	Fla.	Cal.	Total	Cal.	Cal.	Fla.
1947-48	1,910	590	2,500	.....	.....	.....
1948-49	10,233	1,963	12,196	.....	.....	.....
1949-50	21,647	3,490	25,137	1,702	91	2,888
1950-51	30,758	41,180	34,938	3,437	205	433
1951-52	44,000	3,700	47,700	5,293	657	1,100
1952-53	46,500	4,000	50,500	9,845	868	2,000
1953-54	65,531	2,000	67,531	.....	.....	.....
1954-55*	68,350	2,500	70,850	9,000	800	2,500

*Estimated

Courtesy of Quick Frozen Foods magazine.

third of the total frozen food traffic which has to be moved. The total traffic is a potential at least equal to the railroads' present share of the entire fresh citrus crop.

The evidence is strong that the mechanical refrigerator car is the key to an increase in the railroads' proportion of this business. While the necessity for the maintenance of maximum temperatures not to exceed 0 deg F was first emphasized in relation to citrus concentrates, the producers of other frozen foods will no longer be satisfied with any higher temperatures.

What About Fresh Vegetables?

Two other groups of perishable commodities in the handling of which mechanical refrigerator cars offer some advantages, but for the handling of which they are not essential, are fresh fruits and vegetables. These amount to much larger tonnages and many times more refrigerator carloads than even the potential frozen-food volume. They are the commodities for the movement of which the Refrigerator Car Committee of the United Fresh Fruit and Vegetable Association worked with the railroads to establish a set of requisites for a general service refrigerator car. They call for temperatures ranging from 33 to 70 deg. They are refrigerated with water ice, or water ice and varying percentages of salt, in bunkers, with top icing and, under some conditions, with ventilation.

Some marked changes have taken place in the methods of packing and distributing some of the fresh fruits and vegetables which move in large volume. Until recently lettuce from Arizona and California was packed in wooden crates holding four or five dozen heads. The lettuce was packed with ice and the load was top iced in the car. The new practice which now predominates is to pack the lettuce dry in fiberboard cartons each holding two to two and one-half dozen heads which are cooled with bunker ice and no top ice.

Carrots were formerly packed with tops on and refrigerated with top ice and ice in the crates. Now a large part of the crop, with tops removed, is prepackaged in polyethylene bags and shipped dry in wirebound or fiberboard master containers. The major part of the lemon crop, a substantial portion of the oranges, and some apples from the Pacific Northwest are also being shipped in cartons. These changes have been dictated by the desire to reduce expenses, to facilitate handling in the retail store, and to find favor with the housewife.

The new methods of packaging have been accompanied by the development of vacuum precooling in the case of lettuce and water cooling of carrots, so that the refrigerating load of the car is reduced substantially to that required to hold the lading at the desired shipping temperature. The pre-cooling capacity available in the field, however, is not yet equal to the demand and many carloads of the dry packed fruits and vegetables must have the field heat removed after they are loaded in the car. Because of the tightness of the fiberboard-carton load, this creates a new problem, particularly in cars without fans.

Where do the railroads stand in relation to the fresh fruit and vegetable markets? By no means in a dominant position. From Florida during the 1950-51 season the railroads moved over 60 per cent of the citrus fruit; during 1953-54, they are reported to have handled only 46 per cent of the crop. Their proportion of Florida fruits, other than citrus, and of vegetables dropped from 49 per cent during the 1950-51 season to 44.5 per cent during 1953-54.

In California during the 1953 season the Sunkist growers produced a tree crop of about 104,000 carloads. Of the 75,000 cars which were marketed as fresh fruit, 48,000, or 64 per cent, moved by rail. All of the fruit which moves east of the Mississippi river has long moved by rail, but trucks are beginning to encroach even on these long-distance routes.

During the 1945-46 season 95 per cent of the apples from the Wenatchee and Yakima districts of Washington were moved by rail. During the 1952-53 season the railroad proportion of the crop had dropped to 79 per cent.

The mechanical refrigerator car has not yet played any part in the transportation of fresh fruits and vegetables. A few carloads have been handled experimentally, but the demand for these cars for the movement of frozen commodities has not yet been satisfied and none are available for other use. The opinion among shippers is quite general that for the temperatures required by fresh fruits and vegetables there is no justification for the use of the high-cost mechanical car. The demand here is for cars that meet fully the UFF&VA specifications for ice bunker cars, with emphasis on cars equipped with fans.

Meat Packers Are Experimenting

The mechanical refrigerator car is now on trial in meat service. John Morrell & Co. has 25 mechanical refrigerator cars in service between Sioux Falls, S.D., and Florida and is now acquiring 15 more. The 40 cars will provide complete mechanical service for all products shipped into Florida. The cars now in service have effected an improvement in the condition of the products at destination. Tangibly, the improvement is difficult to evaluate, but the competitive effect is favorable.

Swift & Co. now has two mechanical cars in service. Evaluation of the service of these cars cannot be made until after they have been through at least one summer.

POTATOES, which account for half of all the carloads of fresh vegetables, are a sensitive perishable product. Illustration shows loading at the Tri-County Potato Association packing plant on the FEC at Hastings, Fla.

Perishable Demands Are Exacting

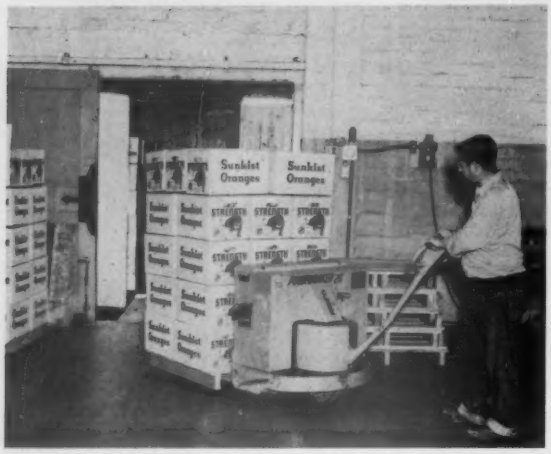
Close temperature control preserves quality of fresh fruits and vegetables — Flavor and storage life of frozen foods requires temperatures of 0 deg or lower

The demands made on refrigerator cars today are very different from those made when the cars were boxes insulated with sawdust. Little was then known as to the effect of temperatures on perishable products, except that temperatures lower than those encountered during hot weather delayed spoilage of fresh fruits, vegetables, and meats.

Today, the relation of temperature to the processes of change which take place continuously in vegetable and animal products, fresh or frozen, are much better understood.

The requirements differ widely among these products, and the optimum range of temperatures within which each should be held in transit are now fairly well established.

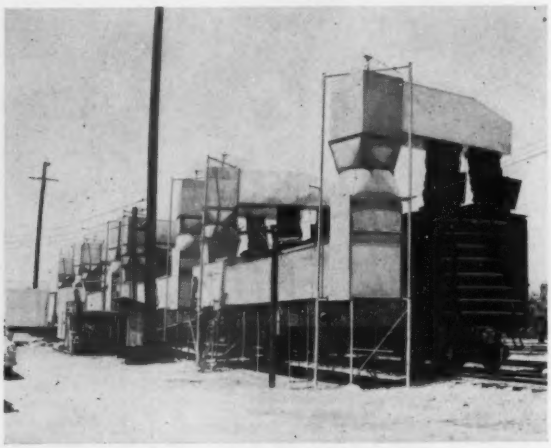
How to deliver fresh fruits and vegetables to market in the best condition possible is the objective of continuous experiments, many carried on under the direction of the Agricultural Marketing Service of the United States Department of Agriculture and others by the growers and distributors. These trial-and-error tests have determined practical icing and reicing programs, the most effective load pattern, the most satisfactory range of temperatures to insure arrival at destination in the desired condition, and whether and under what conditions ventilation should be applied. When these questions have been settled for a particular commodity and a particular route, the movement becomes routine, with need for the exercise of judgment in altering refrigeration to meet changing weather conditions or to care for delays and in determining when to supply heater service. These results are attained with control over refrigeration confined to the



INCREASING USE of cartons in place of crates is a recent trend. *(UFF&VA)*

ELECTRONICALLY controlled icing machine services two lines of reefers at once, can ice a car in 90 sec.

TOP ICING refrigerator cars at Blue Island, Ill., on the New York Central.



BEFORE LOADING, this California plant precools ice refrigerator cars. *(Photo courtesy UFF&VA)*

amount of ice and salt supplied at the initial icing and at reicings en route.

By far the greater number of fresh fruits and vegetables require storage at temperatures ranging from 30 to 32 deg F and temperatures during transportation very little higher. There are a number of exceptions, however. Some fruits and vegetables require that temperatures be maintained at 45 deg, 50 deg and higher to prevent damage caused by chilling. Several vegetables—tomatoes, cucumbers, sweet peppers—are among the items on which the loss and damage claims per car have been found to be largest.

Tomatoes chill at temperatures below 50 deg F, after which ripening is retarded and the tendency to decay accelerated. The range of temperatures desired is 50 to 65 deg F. In test shipments of California fall tomatoes, reported by the Agricultural Marketing Service, those transported at 46 to 48 deg average temperature had 24 per cent waste; those which moved at 51 deg had 10.5 per cent waste, and at a transit temperature of 61 to 62 deg waste was reduced to 6 per cent.

New potatoes turn brown and start to decay at skinned spots at temperatures below 50 deg F. Above 50 deg these spots heal and seal out decay-promoting organisms. When temperatures exceed 75 deg decay again is found to develop.

Peaches, which are not well adapted to cold storage, are best preserved at a temperature of 31 to 32 deg. But the most rapid loss of flavor occurs and breakdown develops sooner at temperatures between 36 and 40 deg than at either lower or higher temperatures. This narrow range between the best and the worst temperature conditions may account in part for the high loss and damage claims per car which are paid on peaches.

Bananas are one of the most sensitive fruits handled in refrigerator cars. They require not lower than 56 deg to avoid chilling and, under some conditions, require ventilation. Dependence is not placed on a specified

icing service to carry them through to destination; the cars are opened and the fruit inspected en route. The cars are serviced to meet whatever conditions are found by these inspections and the tariff provides for inspectors to accompany a car or cars, if desirable.

An important element of the refrigerator-car environment for fresh fruits and vegetables is a high degree of humidity.

For most common fruits and vegetables the desirable degree of humidity ranges between 85 and 95 per cent. For leafy vegetables, such as lettuce, this has been maintained in effect by package and top icing. With the change in packaging, however, this source of freshness is rapidly declining. The tightness of fiberboard cartons, which make difficult the cooling of the load, tends to slow down the process of evaporation and precooled loads are easily delivered in a satisfactory state of freshness.

Why Zero for Frozen Foods?

The insistence on temperatures not to exceed 0 deg F for the shipment and storage of frozen foods is to protect the flavor and appearance and to maintain a satisfactory storage life. The solids in orange juice concentrates tend to precipitate after exposure to temperatures higher than 0 deg and the flavor changes. At temperatures well below freezing the rate of change of sugar to starch in certain vegetables is greatly accelerated over that which takes place at temperatures of 0 deg or below. These changes impair flavor.

How storage life is affected by temperatures above zero is illustrated by lima beans. If maintained at 0 deg, they have a storage life of 14 to 16 months. This is reduced to 6 to 8 months at 10 deg above zero. Peaches, which remain in good condition for 18 to 24 months at 0 deg, will not remain in the same condition longer than 6 to 8 months if stored at a temperature of 10 deg above zero.

Somewhat similar shortening of storage life affects practically all frozen fruits, vegetables and seafoods. Storage life of lobsters, for instance, is reduced from 8 to 10 months at the lower temperature to 6 to 8 months at the higher.

The shipment of fresh meats from the packers' plants is said to present a special problem because of the mixed loading in packers' cars. Shelf goods, which do not require chilling, and others which are normally chilled no lower than 60 deg, are loaded in the same car with fresh meats which require chilling to temperatures in the low 30's.

To offset the effect of the warm goods on the products which should be kept cold, low-temperature air circulated in fairly large quantities is needed.

The Perishable Protective Tariff

The instrument by which the correct refrigeration service is rendered for each commodity on each route is Perishable Protective Tariff No. 16. This is a code of rules governing the transportation of perishable freight and charges for refrigeration, ventilation and heater services. For fruits, berries, vegetables, and melons refrigeration service is rendered at stated charges per car load, plus charges for the salt used, for each route.

COMPARATIVE CARLOAD CHARGES FOR REFRIGERATION

EXAMPLE: APPLES FROM OREGON TO JERSEY CITY

Ice charges compared with mechanical refrigeration charges and with the principal mechanical refrigeration cost

Standard refrigeration service*	$125.64
Initially iced, do not reice (Rule 240)*	18.52
Initially iced by carrier (Rule 247)*:	
Reiced once in transit	64.80
Reiced twice in transit	84.64
Reiced three times in transit	97.75
Preiced and replenished by carrier*:	
Do not reice	53.57
Reiced once in transit	71.42
Reiced twice in transit	91.25
Reiced three times in transit	103.50
Mechanical refrigeration charges (Rule 171)	125.64
Cost of fuel for mechanical refrigeration (10 days, 220 gal)	42.00

*Does not include charges for salt used.

These rates under various rules cover full standard refrigeration, initial icing only, initial icing and a limited number of reicings, half-stage refrigeration, top or body icing, and cooling the lading after it has been loaded in the cars. The rates under these rules provide a wide range of graduations in the amount of ice used and paid for, grading downward from full standard refrigeration.

For icing and reicing fresh meats, packing-house products, dairy products, fish, bananas, cocoanuts and beverages, charges are made for the ice and salt used and for switching.

The services rendered under Perishable Protective Tariff No. 16, for which the railroads are responsible, includes the furnishing of ice at originating points and reicing on regular routes at some or all succeeding stations, which are spaced approximately 24 hours apart. The frequency of reicing depends upon instructions from the shipper under a number of rules covering a variety of services. They include adjusting the hatch covers for ventilation when called for. They include unloading bunkers and placing heaters in the bunkers when protection against freezing is necessary.

What Basis for Charges?

Charges for mechanical refrigeration service are based on those made for the use of ice and salt. For frozen products, the charge is one and one-half times the standard refrigeration charge for fresh vegetables. For fresh fruits, melons, berries, and vegetables, the charge is that for standard refrigeration for the same product. For meats, poultry, fish and beverages, the charge is that for standard refrigerator service for fresh vegetables.

Aside from inspection en route, the out-of-pocket cost of rendering mechanical refrigeration is confined essentially to the cost of the fuel and lubricating oil consumed by the system.

This is much less than the cost of full standard refrigeration for the same route. In the case of a load requiring full 30 per cent salt, the cost of the salt alone is more than the cost of fuel for the mechanical car for the same trip.

A 50-FT, 70-TON mechanical refrigerator car, one of 100 built by Fruit Growers Express at Alexandria, Va., in 1955. Cars have rubber draft gears and trucks with bolster snubbers, roller bearings and wrought-steel wheels.

Mechanical Controls Are Precise

Complete automatic control of perishable protection replaces intermittent adjustments—Still considered too expensive except for frozen foods—Six systems now available; more to come

The evolution of the modern refrigerator car began in 1903 when the United States Department of Agriculture undertook a series of investigations on the protection of Georgia peaches and California citrus fruit in transit. Since that time the interest of the Department of Agriculture in transit refrigeration problems has been continuous, formerly under the direction of the late Dr. Mary E. Pennington and now under the direction of Dr. W. T. Pentzer, head of the Quality Maintenance and Improvement Section, Agricultural Marketing Service. These investigations demonstrated the need for more and better insulation, adequate refrigeration, and better air circulation.

The General-Purpose Bunker Car

In 1945 the United Fresh Fruit and Vegetable Association organized a Refrigerator Car Committee. This body, under the chairmanship of John N. Kelley, manager fruit transportation, Fruit Dispatch Company, formulated a set of specifications covering what were considered the essentials for a general purpose ice-and-salt refrigerator car. Since the products of the members of this association account for almost half of all refrigerator-car loadings and, with the exception of frozen foods, present the most exacting refrigeration requirements, and since there was nothing in the recommendations the value of which individually had not already been demonstrated, they were generally accepted with little opposition.

Few, if any, refrigerator cars have been built in recent years which do not at least equal these specifications and in some respects exceed them. They call for at least 4 or 4½ in. of insulation, air-circulating fans, floor racks with adequate air passages underneath and bunkers equipped for half-stage icing. There is less unanimity of opinion as to the desirability of the present sliding side doors. These doors, 6 ft wide, are being generally applied on new cars to permit loading and unloading with industrial trucks. Inspection of bananas in transit, however, requires entering the car. In unfavorable locations and in winter weather one man cannot always open the doors.

Few refrigerator cars are rebuilt today without including circulating fans. But waiting for rebuilding periods for the conversion of old cars is a slow process and accounts for the fact that only about half of the general-purpose bunker cars are now equipped.

There is one phase of perishable protective service in ice-and-salt cars which is still not completely satisfactory. That is heating service. The automatic heaters now available are an improvement over the charcoal heaters on which dependence formerly had to be placed, but their use requires hatches to be opened for their in-

stallation and removal. The maintenance of uniform temperatures with them is only approximate. It may also be necessary to remove ice from the bunkers before the heaters can be put in place.

The underbody heater from which the heat is distributed by an antifreeze solution through a coil laid around the sides and ends of the car is extensively used in Canada and to some extent in the United States. This can be placed in service without opening the car. Building the fire and regulating the draught to meet an anticipated situation, however, requires experience and a good deal of skill. It also adds to terminal delays.

Mechanical Refrigeration

The search for a refrigerating medium other than salt and ice has been going on for a good many years. In 1928 a silica gel reactivation system was developed by the Safety Car Heating & Lighting Co. This was ultimately installed in about 80 cars. The cycle comprised alternate adsorption of the refrigerant by the silica gel and its reactivation by the heat from a propane gas flame applied to the silica gel. This system produced a minimum temperature of 20 deg F. After about nine years it was abandoned.

The North American Car Company developed an axle-driven ammonia system in 1929 for application to its own refrigerator cars, the use of which was never extended. Refrigeration was effected by direct-expansion ammonia evaporators and a brine tank for storage of refrigerating effect to care for standby periods.

The effectiveness of ice-and-salt refrigeration to care economically for the variety of requirements in the range of temperatures above freezing offered no opportunity for other means of refrigeration until after the development of frozen foods. During the early years of the frozen-food industry there was some thought that frozen foods would be almost self-refrigerating—at least, that they would not require any degree of protection which could not be afforded by the ice-and-salt refrigerator car. After the advent of the citrus concentrate industry in 1945, however, it was not long before it was evident that the transportation agency which could hold product temperatures at 0 deg or lower would have the edge on this business.

The FGE Goes to Work

Attention has already been called to the fact that the early development of the citrus concentrate industry was largely in Florida. In 1948 the Fruit Growers Express Company, which furnishes the refrigerator cars for the perishable movement out of Florida, and its associates, the Burlington Refrigerator Express Company and the Western Fruit Express Company, set up an experimental program to meet this situation. Nine different refrigerating systems, installed in 16 cars, were compared. Among these were water ice, dry ice, the split ammonia system, the Thermo-King direct-connected gas-engine intermittent system, and the Frigidaire system with a continuously operating diesel-electric power plant.

Tests soon eliminated the split ammonia system. It proved to be difficult to prevent ammonia leaks, and the ammonia contaminated the lading. One carload, condemned because of such contamination, was a complete loss. There is also the public hazard should an accident cause the release of the ammonia to the atmosphere. Dry ice was eliminated as a regular refrigerant because its price is too high. The cost of dry ice on a transcontinent carload amounts to more than the freight charges. The gasoline engine of the early Thermo-King system is also considered a hazard. Under AAR rules these cars may be rejected at the discretion of the receiving line.

When the cars now on order are completed, the three associated companies (FGE, BRE and WFE) will have 596 cars with Frigidaire equipment developed in cooperation with them, two cars with Thermo-King spark-ignition diesel-oil engines, one with the Trane system, and two Waukesha cars—a total of 601 mechanical refrigerator cars. Ten additional such cars are authorized, but the type of refrigeration system has not been determined. All but 151 of these companies' cars will be fully equipped to maintain temperatures from zero degrees or less to 70 degrees, either under refrigeration or heating, by thermostatic control. The 151 cars are fitted for frozen foods only. There are 74 40-ft, 50-ton cars; all the others are 50-ft 70-ton (so-called giant) cars.

The experience of these companies with mechanical refrigeration has been satisfactory. The equipment has proved to be reliable. Up to the end of March the mechanical cars of these companies had handled 16,200 loads and run up 29,000,000 loaded car-miles without the loss of a single load and only minor claims. Experience so far indicates that the refrigeration plants will operate at least 20,000 hours (about five years' service) without overhaul.

During 1953 the Pacific Fruit Express and the Santa Fe both built mechanical refrigerator cars. The first 10 of 30 built by the Santa Fe were equipped with the Trane refrigerating system, which includes a continuously operating diesel-electric power plant. The Frigidaire and the Carrier systems were applied each to 10 of the remaining 20 cars.

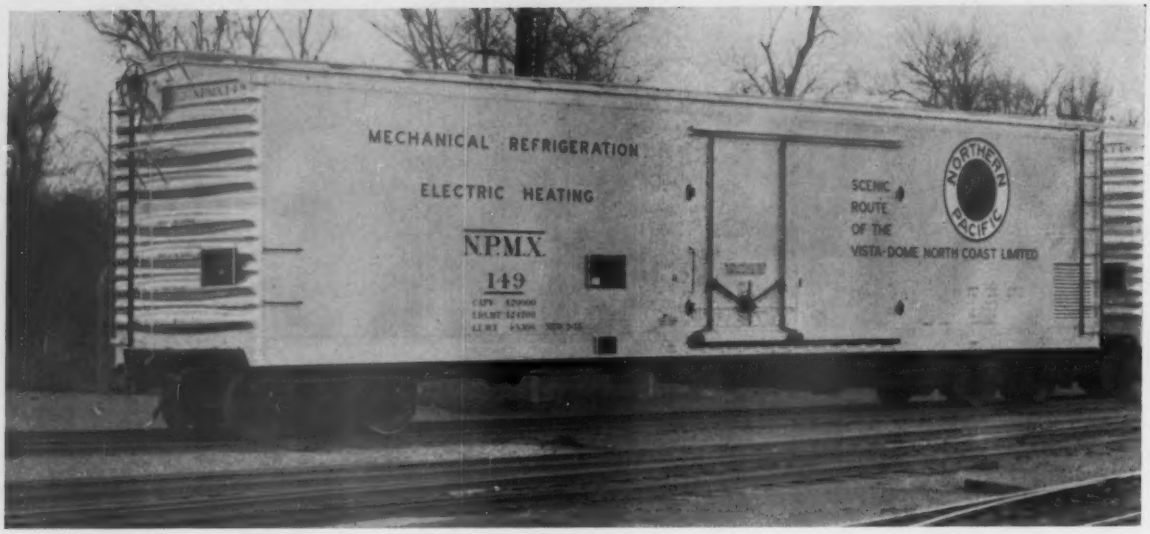
The first PFE order was for 25 cars, followed shortly by one for 100 additional cars. The first 25 cars were divided between the Frigidaire and Trane systems. The following 100 cars were Frigidaire. PFE now has 337 mechanical refrigerator cars either in service or on order;

A CENTURY OF REFRIGERATOR CARS

Basically, a refrigerator car is a box-like container with insulated walls and some means of cooling the interior in which perishable products are loaded for shipment.

The first trial of mobile refrigeration is believed to have been in 1857. A box car insulated with sawdust and containing iceboxes was used for the shipment of fresh meat. In 1868 Parker Earle, an Illinois fruit grower, shipped strawberries and peaches experimentally in containers in which the fruit was packed with ice. The results were not entirely successful, but Earle later succeeded by putting the ice in large bunkers in the car.

Swift began the shipment of fresh meat in privately owned refrigerator cars in 1875. Transcontinental shipments began in the 1880's in cars with bunkers holding four or five tons of ice. These were first used to carry strawberries and, later, oranges from California.



ONE OF 50 50-ft mechanical refrigerator cars recently built for the Northern Pacific. The mechanical equipment is Frigidaire.

the Santa Fe, 180. These cars are all designed for frozen-food service with temperatures at 0 deg or lower.

The second group of mechanical refrigerator cars to be placed in operation was for meat service. These are the 25 Morrell cars which have Thermo-King refrigerating equipment. The gasoline engine in these cars is of relatively light capacity. The 15 additional cars now being equipped will have a spark-ignition oil engine which develops 30 hp.

Present Mechanical Refrigerating Systems

There are at least six mechanical refrigerating systems now in service. Five of them are operated by diesel-electric power plants which run continuously. In the sixth a spark-ignition engine is directly connected to the condenser and operates intermittently under control of the thermostat. Five of the systems refrigerate with air blown over condenser coils. One refrigerates from cold plates placed over the top of the load. Five of the systems are installed in the approximate equivalent of one bunker space. The sixth is installed under the car body and in one or two hatches. The refrigerant used in all of the systems is Freon-12. A brief description of the essential features of these systems follows.

Thermo-King. The latest development of this system comprises a 30-hp four-cylinder Continental spark-ignition engine burning No. 1 diesel oil or water-white kerosene. This has an electric manifold heater to vaporize the fuel and drives a 47.1 cu-ft refrigerant compressor. The refrigerating capacity is about 2.5 tons when operating between 100 deg F ambient and 0 deg F inside air temperature. Car heating, when called for by the thermostat, is accomplished by hot gas in a reverse cycle. The engine, compressor, starter-generator, condenser, evaporator, fans and their drives, and the controls are all mounted as a unit on a single base. The unit weighs 1,525 lb.

Frigidaire. The power plant is a 34-hp Detroit two-cycle diesel engine directly connected to a Delco 20-kw, 3-phase, 220-volt, 60-cycle generator which operates continuously. There are two sealed compressors, each driven by a 5-hp motor. Two condensers are assembled in a single structure. The cooling unit has two evaporator sections, and one condensing unit is connected to each section. Tubular heating elements of 6,000 watts capacity defrost and furnish heat for the car when called for by the thermostat. The refrigerating capacity is about 2.5 tons at 0 deg F car temperature and 100 deg F ambient. Fuel consumption is 0.8 to 1 gal per hr.

Trane. A Hercules 52-hp 6-cylinder diesel engine drives a 25-kw 220-volt, 3-phase, 60-cycle generator. The compressor is nominally rated at 15 tons. The condenser on the first PFE installation has a heat exchange surface of 887 sq ft; the evaporator, a surface of 554 sq ft.

Carrier. The diesel-electric power plant is rated at 20 kw and weighs 2,000 lb. Two compressors, each nominally rated at 7½ tons, are driven by 7½-hp motors. The two compressor-motor combinations may be used singly or as two separate refrigeration systems. For light loads with only one compressor operating, approximately 60 per cent of full capacity can be attained. Electric heaters are used for automatic defrosting plus car heating. Refrigeration equipment totals 2,490 lb.

Waukesha. A 42-hp 6-cylinder diesel engine, directly connected to a 20-kw, 220-volt, 3-phase, 60-cycle generator, is mounted under the car. For starting in cold weather the engine cooling system has a 110-volt heating element. A Chevron capsule-type primer is also used in starting. The power unit weighs 2,100 lb. There are either one or two air-conditioning packages. Each contains a compressor, condenser, evaporator, motors and fans. Each is mounted in a bunker hatch with the cold section down in the bunker and the hot section above the hatch.

Each unit develops 1.5 tons operating at 0 deg F inside and 90 deg F ambient, and weighs 1,150 lb.

Saylor-Beall, Dole, Fairbanks-Morse. This system employs cold plates to distribute the cooling effect instead of evaporators and fans. The cold plates constitute a refrigerating reservoir the temperature of which will rise at the rate of about 1 deg an hour after a failure. The Brunner compressor is rated at 5 hp and 7½ tons at 40 deg suction temperature; 1 ton at —20 deg suction temperature. The system weighs 6,100 lb.

In addition to these six systems which have already been developed to the point of use, York and International Harvester are working on this problem and will probably have refrigerator-car systems ready soon.

Production of a 50-ft mechanical refrigerator car based on a 40-ft prototype developed by the Electro-Motive Division of General Motors is now under way. The welded all-steel body is an envelope container mounted resiliently on the underframe. It may be lifted off as a unit. Insulation is structural plastic foam. Refrigeration is by Frigidaire. Doors are 8 ft wide.

In appraising the value of mechanical refrigeration, economics is not the question in the frozen-food field. The price has to be paid to retain the business. As a competitor of the ice-and-salt car, however, the problem is different. Here an economic balance must be struck.

There are several features of mechanical refrigeration service which are of advantage in handling most fresh fruits and vegetables:

Accurate Temperature Control. Refrigeration with ice and salt and protection against frost with heaters which must be placed in the car or be fired and adjusted en route provides only an approximation of the ideal temperature at which the commodity in the car should be held. Under both refrigeration and heating, interior temperatures fluctuate with the changing ambient. The accurate control of temperatures within plus or minus 2 deg by thermostat setting under weather conditions requiring both refrigeration and heating provides a uniformly close control of the condition in which the commodity is delivered. For example, a carload of peaches, picked riper than is customary for shipment in an ice-and-salt car, realized from $1.00 to $1.50 more per basket than those shipped in ice-and-salt cars.

Out-of-Pocket Cost of Refrigeration. With a consumption of about one gallon of diesel fuel per hour of operation, the cost of fuel per trip is much less than the cost of ice and salt for standard refrigeration and less than the cost of most of the limited services. Under present rules in Perishable Protective Tariff No. 16, this does not benefit the shipper, who pays standard refrigeration rates unless he is operating under the experimental Rule 170. When mechanical refrigeration comes into extensive use for fresh fruits and vegetables, rates commensurate with its cost will be needed.

Better Cars. When temperatures of 0 deg F and lower must be maintained, 4 to 4½ in. of insulation will not be enough. Already, many cars are being built or rebuilt with 6 to 7 in. of insulation, looking forward to the time when it will be expedient to convert them from ice and salt to mechanical refrigeration.

To protect the refrigerating equipment from undue shocks, mechanical refrigerator cars are being equipped with rubber draft gears, some with cushion underframes, and trucks with long-travel springs and vertical snubbers.

The mechanical refrigerating equipment takes less space than the ice bunkers of ice-and-salt cars, and weighs less than a full load of ice. This means more weight (about 5 tons on a 40-ft car) and more space capacity (say 20 per cent) for revenue load.

No More Ice and Salt Damage. Freedom from the use of salt offers relief from a cause of serious deterioration of refrigerator cars and from damage to bridges and other track structures. Salt damage is difficult to appraise in terms of dollars and cents. There can be no doubt, however, that the absence of salt will prolong the life of refrigerator-car bodies—perhaps as much as a third.

Reduced Protective Service En Route. No mechanical refrigerator cars have been in service long enough to establish the ultimate pattern of the service they are going to require en route. It seems probable, however, as the more obvious causes of uncertainty have been eliminated from the equipment and as personnel has become conversant with the road habits of the cars, that the cost of servicing these cars en route will be lower than the cost of servicing ice-and-salt cars, if the cost of reicing the latter is included, Heater service requires no attention other than routine inspection and adds no expense which is not already required for refrigeration.

Faster Movement. It seems obvious that, if and when mechanical refrigeration becomes the universal method of protecting perishable products in transit, the movement of perishables will be expedited. What is not so generally realized is that the absence of the need for stops to reice is already expediting the movement of mechanical refrigerator cars. They are now being moved in merchandise or other fast freight trains rather than in solid refrigerator-car trains or blocks of refrigerator cars.

Unfavorable Factors

These, then are favorable factors which, in the aggregate, can produce a substantial tangible effect. At present, however, it is impossible to evaluate them individually in terms of dollars and cents. And, of course, they are only one side of the account. The obvious disadvantages are:

First Cost. The most loyal supporters of mechanical refrigeration as the ultimate successor to ice and salt refrigeration recognize that the present cost of mechanical refrigerator cars is too high to be economically feasible in competition with ice-and-salt cars, except for the transportation of frozen foods. Some informed opinion sets the excess at 50 per cent. There is a fairly strong feeling among some officers of private car lines (not all of them) that this handicap will be overcome before the question of the use of these cars for the movement of fresh fruits and vegetables ceases to be entirely academic. It will be some time before enough mechanical cars are available to meet the demands of frozen citrus concentrates, not to mention the large production of other frozen products, most of which the railroads are not handling now.

Equipment of less refrigerating capacity than that being furnished for maintaining temperatures of 0 deg and lower is being considered for products which move at temperatures above freezing. Such equipment will be feasible if precooling before loading becomes the universal practice. So long as refrigerator cars are expected to remove field heat rapidly as well as to main-

tain desirable transit temperatures, less refrigeration capacity than is now employed in frozen-food service will not be practicable.

Fresh fruit and vegetable shippers look with some concern at the growing interest in mechanical refrigeration because of the high first cost of the cars. They fear that if mechanical cars replace the ice-and-salt cars, a move for an increase in rates will follow. If, however, freight rates are unaffected, if perishable protective rates are established in keeping with mechanical refrigeration costs, if the dehumidification problem is solved to their satisfaction, and mechanically refrigerated 40-ft, 50-ton cars are made available in quantity, it seems probable that mechanical refrigeration service will be acceptable to shippers of fresh fruits and vegetables.

Maintenance Cost. What is it going to cost to maintain mechanical refrigerator cars? No one has yet had enough experience with them to do more than speculate as to the ultimate cost. Experience of Fruit Growers Express and its associated companies has indicated a service of 20,000 hours of power-plant operation (equivalent to about five years) without need for refrigerating-equipment overhaul. The question may be asked "Will not the saving in ice and salt damage offset the ultimate cost of maintaining the mechanical equipment?"

Reliability. Those with the longest experience express the greatest confidence in the ultimate reliability of mechanical refrigeration equipment. That such equipment, at the outset, should be subject to failures is to be expected for two reasons: details of the equipment need altering and adjustments must be worked out; and personnel failures during the early training period are inevitable. Once this period of adjustment is over, it is improbable that mechanical failures will exceed failures on ice-and-salt cars caused by bad judgment in specifying icy schedules, by delays, or by improper handling of fans.

Dehumidification. The handling of fresh fruits and vegetables and fresh meat in mechanical refrigerator cars presents a problem which is not encountered with frozen foods. That is the tendency toward dehumidification of the lading. Most fruits and vegetables require humidities of 85 to 95 per cent in cold storage.

The relatively large differences in temperature between the cooling surfaces of the evaporator of a car refrigeration system and of the air passing over them cause a heavy precipitation at these surfaces which leads to shrinkage and loss of weight of the product. This condition has been improved by completely enclosing the load in an envelope with side, top and bottom passages around it, through which the cold air flows. This insulates the load from the relatively warm car walls and protects the lading from the dehumidified air from the evaporator if the load has been precooled. If cooling is required in the car, however, air must flow through the load to pick up heat. To permit this, adjustable louvers are provided in the ceilings of some cars.

The larger the heat-absorbing surfaces of the evaporator and the smaller the differential between the surface temperature and the cold-air temperature, the smaller the amount of dehumidification. Hence, the largest possible evaporators with accompanying higher refrigerant tempeatures are desirable.

In practice this problem is not yet competely solved.

Summary

The mechanical refrigeration of refrigerator cars has grown rapidly since the comprehensive investigation of possible types of refrigeration by the Fruit Growers Express and its associates was begun in 1948. Prompt action in the development of practicable systems has saved a major part of the citrus concentrate business for the railroads.

What is the future of mechanical refrigeration in railway refrigerator-car service?

The estimated output of commercial frozen foods in 1954 amounted to 3,993,000,000 lb.—nearly 2,000,000 tons—and the volume is growing. The railroads have retained over 60 per cent of the citrus concentrates, but this amounted to about 360,000 tons in 1954—a small part of the total. To handle the 1954 total business would require roughtly 5,000 mechanical refrigerator cars. By the end of 1955 there will be a few more than 1,200 of these cars in the United States.

Until the frozen-food potential has been exhausted, the question of the further replacement of ice-and-salt refrigerator cars with mechanical cars will remain academic.

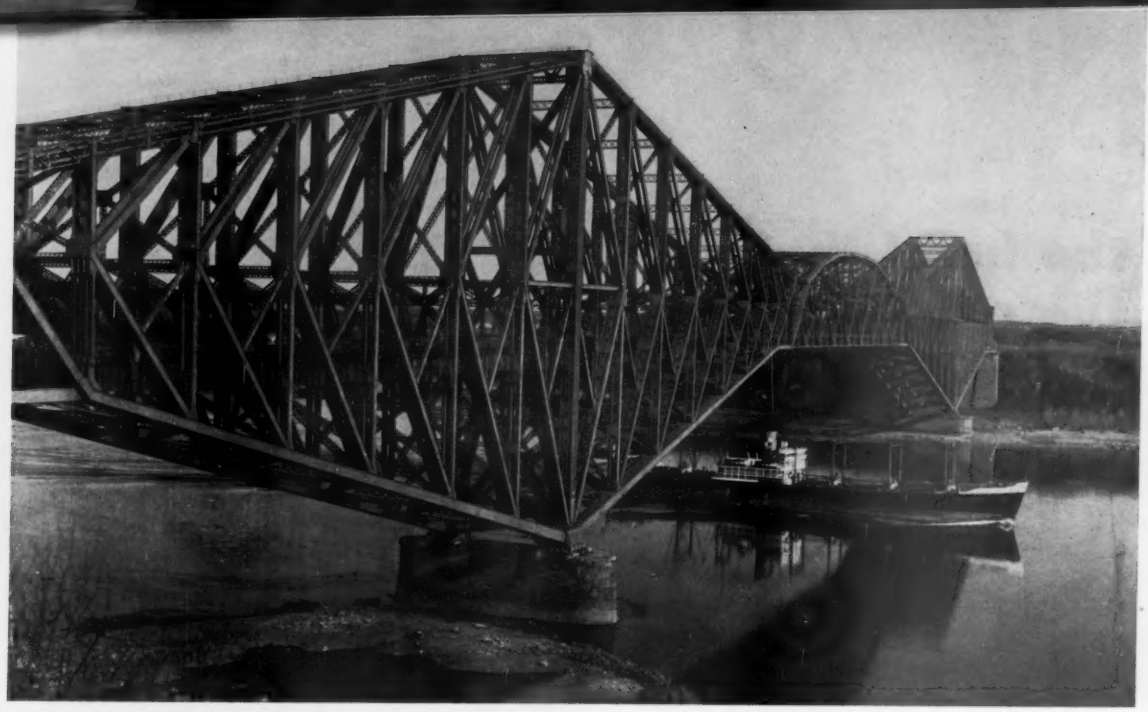
When the needs of the frozen-food industry have been satisfied, it will then be time to evaluate the advantages of mechanical refrigeration service in terms of its ability to attract fresh fruit and vegetable traffic to the railroads, in relation to first cost and cost of maintenance, as these factors appear at that time.

HOW MAN FAILURES ARE PREVENTED

The successful performance of the mechanical refrigerator cars on the contract lines of the Fruit Growers Express Company, the Burlington Refrigerator Express Company, and the Western Fruit Express Company has depended to a large extent upon the training of the men who service and maintain the cars. The cars are built in company shops. Advantage has been taken of this to bring men in from outside points in groups for about two days each when new cars are being built so that they can familiarize themselves with the refrigerating equipment.

The training program has two branches. Service department men, who inspect and service the cars under load, are trained to recognize and diagnose trouble and make emergency repairs. The employees of the mechanical department give the cars pretrip inspection and service at terminals when not under load. These men are trained to make all required repairs.

Leaders of the maintenance men are sent to short intensive training courses, conducted periodically by Frigidaire and Detroit Diesel, which cover trouble shooting and preventive maintenance. These men, in turn, instruct the maintenance employees at the various refrigerator car shops on the contract lines of the three companies.



". . . A STUDY of basic concepts . . . reveals that the 'prior right' of navigation is nothing more than a mythical concept."

IN NAVIGATIONAL CLEARANCES . . .

"Fair Play" for the Railroads

"New era of understanding" seen as result of exhaustive study by Department of Commerce to determine cost of meeting clearance requirements at bridges across navigable streams

This article is based on an address by Paul F. Royster, assistant to under secretary for transportation, Department of Commerce, at the recent annual meeting of the American Railway Engineering Association in Chicago.

The Department of Commerce recently issued a comprehensive report described as the initial phase of a concerted effort "to point out the need, in the public interest, for realistic federal policies concerning navigational clearance requirements for highway and railroad bridges." The report recommends classifying waterways and determining standard navigational clearances of—and financial responsibility for constructing and operating—bridges over waterways. Adoption of the recommendations, it is stated, would save $5 million to $10 million annually in bridge construction. Additional savings of more than $1 million annually "can be achieved in the cost of maintaining, operating and using movable span bridges that oftentimes are opened solely for accommodation of watercraft appurtenances not essential for movement of the craft."

The report was prepared under the direction of Mr. Royster. This article is based on his AREA address, in which he tells why navigational clearances become a matter of national concern. He refers to "untold frustrations" in obtaining some of the data, and gives examples of startling conditions that were brought to light. The report is entitled "Navigational Clearance Requirements for Highway and Railroad Bridges." Copies, at $1.50 each, may be obtained from the Department of Commerce, Room 6225, Commerce Building, Washington 25, D.C.—*Editor.*

For more than a century, when overland transportation interests—rail and highway—raised questions about the reasonableness of navigational clearances in bridges, they have been told that, since waterway transportation was the first to be developed in America, it has a "prior right" or an "inherent right" over land traffic at bridge crossings. The fact that a proposed railroad bridge must be a high-level structure, or must contain a movable span, because at some earlier date a boat navigated beyond the point of crossing, is "old stuff." However, a critical examination of progress made in various modes of transportation since the dawn of civilization fails utterly to substantiate this philosophy of priority. Indeed, a study of basic con-

(*Continued on page* 64)

the hand that writes the specifications

has a few words for the man who consigns the lading

Real cooperation! It's just that when a mechanical man writes "Barber Stabilized Trucks" into his new freight car specifications. The shipper gains a cushioned ride for his lading. The railroad prolongs the life of its cars, protects costly road beds, builds satisfied customers and cuts damage claims. Everybody *saves!*

Simplest, smoothest principle you ever saw. The Barber Stabilized Truck has the fewest possible parts, and they are sturdy. When many years of good performance and normal, necessary friction wear makes it advisable to change the friction shoes, Stabilizer parts can be removed for replacement very quickly. No bars nor prying needed; no costly labor items. Standard Car Truck Co., 332 S. Michigan Avenue, Chicago 4, Illinois. *In Canada:* Consolidated Equipment Company, Ltd., Dominion Square Building, Montreal 2.

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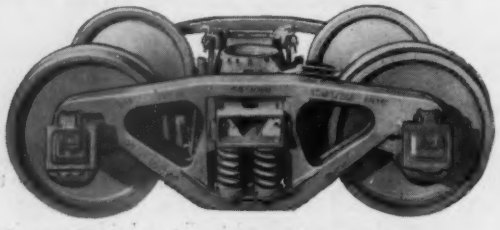
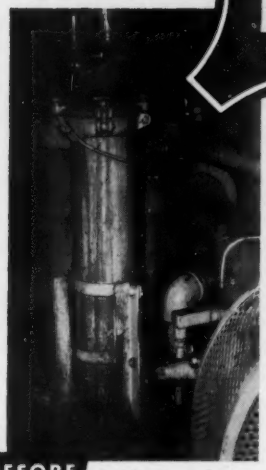
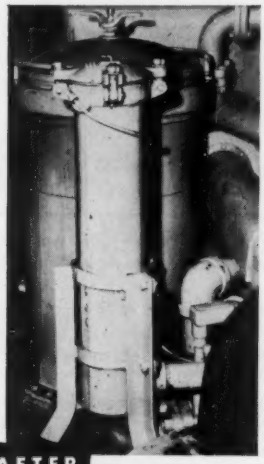


FRISCO

Keeps Diesel Interiors "Clean-as-a-Whistle" with Oakite Composition No. 72



BEFORE Photo shows diesel filter units before spray-cleaned with Oakite 72.



AFTER Same units showing efficiency of Oakite spray-cleaning and rinsing.

Sticklers for absolute cleanliness, FRISCO keeps its diesel engine rooms spotless. They know that cleanliness contributes importantly to mechanical operating efficiency and safety.

FRISCO uses Oakite Composition No. 72 for this important maintenance operation because...

Oakite Composition No. 72 is

SAFE	**It's water-mixed... safe for personnel and paint**
SPEEDY	**Superior wetting action speeds soil penetration and removal**
ODORLESS	**Pleasant to use even in confined cab areas**
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OAKITE

RAILWAY DIVISION

"FAIR PLAY" FOR RAILROADS

(*Continued from page 61*)

cepts embodied in American constitutional government reveals that the "prior plight" of navigation is nothing more than a mythical concept.

History clearly documents the origin of the problem of providing navigational clearances in bridges across navigable waterways throughout the world. The wheel—which is today represented by highway and railway transportation—was developed first; the watercraft came later. The problem arises at the point where transportation by wheel intersects transportation by waterway.

Many technological advancements made in our economy —such as the diesel motor, radio and radar—have been applied to both land and water transportation. However, the standardization of moving and movable equipment which has distinguished our overland transportation system has not so far been adequately realized for equipment moving on our waterways. This apparent lag in adjustment of watercraft to meet the needs of a changing economy, this continued establishment, over the years, of navigational clearances in bridges to satisfy extremes in waterway traffic, was largely responsible for the decision of the Department of Commerce to initiate a nationwide study of this problem, in the public interest.

Why Study Was Made

The department entered into this area of the public business for several reasons:

First, it is charged by law with the responsibility for *improving the overall transportation system* of the United States.

Second, the cost of all forms of transportation is ultimately borne by the general public in the cost of goods the public consumes, in the cost of the services the public receives, and in the taxes the public pays.

Third, with the transfer of the Bureau of Public Roads into the department, it became evident that the expenditure of large sums of public money has been required in the construction, maintenance and operation of highway bridges for accommodation of navigation without having equal or greater benefits—in the form of savings in waterway transportation costs—flow to the public. A similar situation exists with respect to railway bridge costs for accommodation of navigation.

Fourth, the department is firmly convinced that our expanding economy is dependent not on waterways alone, nor railways alone, nor highways alone. All three are needed as a co-ordinated surface transportation system.

Fifth, nothing exists in our constitutional constellation which vests any segment of our economy with "prior right" over any other segment of the economy. Our whole system of government is based upon *relative* rights, with the process of adjustment constantly taking place in all areas of activity. Certainly transportation is no exception.

Sixth, preliminary evidence indicated that there were certain aspects of this problem requiring examination, which never before had been thoroughly studied. For many years there have been *extreme* viewpoints concerning this problem. Some were expressed in waterway transportation circles, others in overland transportation groups.

Seventh, whenever an issue that affects the public interest continues to remain unresolved because adequate data are lacking, the agencies of government concerned with the issue must accept the responsibility for getting the facts out in the open. Based upon the facts, those agencies must chart the course for an action program that reflects today's public interest.

After obtaining Bureau of the Budget approval for the

NINE "POINTS OF AGREEMENT"

As a result of the study of navigational clearances made by the Department of Commerce a number of conclusions or "points of agreement" were established between that department and the Corps of Engineers, and were incorporated in the department's report on "Navigational Clearance Requirements for Highway and Railroad Bridges." Summarized, these conclusions are:

(1) "Bridge clearances should provide for probable future navigational needs, but should not be required for extremes in waterway traffic unless essential to national defense or unqualifiedly required for the economy of a region."

(2) "Clearances for navigation should not be required when no actual or prospective navigation exists."

(3) "Clearances for navigation at times of extreme high water when craft are unable to navigate should not be required."

(4) In cases involving movable-span bridges, "wherein costs due to navigational clearances . . . are not justified by waterway transportation . . . the affected interests should be encouraged to request the appropriate federal official to issue special operating regulations wherever land and water traffic conditions indicate that" such modification is in the public interest.

(5) "The incremental economic cost of providing navigational clearances in bridges should be taken into account in the economic analysis of navigation improvements."

(6) "Standard navigational clearances for bridges across waterways in each category can be established, with full consideration being given to the economics of overland and waterway transportation, the needs of federally owned defense watercraft, and any requirements of craft in foreign commerce."

(7) "Many of the watercraft which operate on the inland streams and intracoastal waterways, and which require extreme vertical navigational clearances can be modified or adjusted so the craft can be accommodated by standard navigational clearances without unduly interfering with the operations of such craft."

(8) "Floating construction equipment can and should be designed to be accommodated by standard clearances."

(9) "Watercraft having fixed projections above their normal superstructure which are not essential should not be allowed to cause delays to overland traffic due to movable-span bridge operations. Such delays can be minimized by modification of bridge-operating regulations."

"MEETING ROOM" . . .

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Forty-three American railroads own P-A-X "inside" telephone systems. These railroads *encourage* employees to use the telephone for exchanging information and instructions; they find that operations are thus speeded up—confusion, delays and errors are held to a minimum. P-A-X telephones on desks, in shops, and at trackside booths provide convenient "meeting rooms" for swift transacting of railroad business!

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study, the Department of Commerce invited every federal agency having an interest in the problem, or which might in any way be affected by the outcome of the study, to participate in the nationwide undertaking.

Within the Department of Commerce this meant the Coast and Geodetic Survey, which operates vessels in the conduct of its work; the Maritime Administration, which has an active and reserve merchant marine fleet and which has certain responsibilities incidental to merchant vessels designed and constructed with federal financing; and the Bureau of Public Roads, the principal road-building agency of the government, which also serves as the focal point between the executive branch of the government and the states on highway matters.

Outside the Department of Commerce, the invited agencies included the U.S. Coast Guard, Tennessee Valley Authority, Department of the Navy, Corps of Engineers of the Army, Interstate Commerce Commission, and Bureau of the Budget.

Hit Snags Over Costs

Major difficulties arose in only two areas of the effort. The first was concerned with the need for a realistic evaluation of bridge costs due to navigational needs. Because the Army Corps of Engineers for many years has been administering federal laws which control navigational clearances in bridges, that agency was entitled to participate in the evaluation. The study contemplated that bridge cost data of *unquestioned acceptability* could be prepared through the joint efforts of the Corps of Engineers, Bureau of Public Roads, and the state highway departments for highway bridges, and of the Corps of Engineers and each bridge owner for railroad bridges.

To facilitate the detailed work, the Bureau of Public Roads had devoted more than a year, including extended field study, in preparation of uniform instructions for evaluating highway bridge costs due to navigational needs. The reasonableness of the instructions thus developed is evidenced by the fact that, following consultation with the Interstate Commerce Commission and review by its own staff, the Association of American Railroads adopted very similar instructions for evaluating railroad bridge costs due to navigational needs.

Tentative agreement was reached at an early date for complete cooperation. However, when this phase of the effort was started, the representatives of the Corps of Engineers pointed out that their agency did not have sufficient authority or funds for this complete cooperation. Therefore, while the Corps of Engineers did participate in the preliminary planning of the study, that agency did not take part in the preparation of the bridge cost data.

The second area of difficulty was concerned with the feasibility and cost of altering watercraft projections. In the Department of Commerce it was assumed that the Corps of Engineers could develop the information, not merely for its own watercraft but also for privately-owned watercraft. Here, again, that agency pointed out after the study was started that it lacked authority and funds to develop the information relating to privately owned craft. Actually, it was not until August 1954, and some time after the data-collecting process was completed by the other cooperators, that the corps actually furnished data concerning the feasibility of modifying its own watercraft.

In mentioning these points Mr. Royster emphasized that he did not suggest or imply any criticism of the Corps of Engineers. Its representatives were in a position to determine what authority their agency has, and what it can and cannot do. The Department of Commerce recognized from its inception that the study was delving into an issue that has been highly controversial for more than a century, and at no time denied any federal agency a real opportunity to take part in the study. By the same token, the Department of Commerce would not compromise its integrity and objectivity in preparing or analyzing the facts needed for a proper evaluation of this complex problem. Said Mr. Royster: "We wanted to play fair with all interests and we expected fair play from them."

To overcome the deficiency of information on privately owned watercraft, the Bureau of Public Roads prepared a detailed analysis of such watercraft (except fishing and pleasure craft, that operate on the Gulf Intracoastal Waterway and the Mississippi River system. The Transportation Council of the department was asked for advisory comments on the effect of navigational clearances in bridges upon transportation costs.

The report on this study, which has just been released, climaxes the initial phases of the department's effort to highlight the need for realistic federal policies concerning navigational clearances for highway and railroad bridges.

What Study Revealed

The study revealed many things. For example, based upon the bridges actually studied in detail, provision for accommodation of navigation, as adjusted to 1950 prices, exceeded $754 million. The total adjusted cost of construction of bridges for accommodation of navigational needs is even greater. Cost data on all the bridges in this category were not available, and tunnels were excluded from the study.

The annual cost of maintaining and operating bridges for accommodation of navigation is estimated at $16 million, and the annual cost of vehicular and train delays resulting from navigational requirements is no less than $11 million.

At least 21 movable-span highway bridges in 13 states, and at least two movable-span railroad bridges, never have been opened for the accommodation of watercraft. No less than 375 movable-span highway bridges in 30 states and 179 movable-span railroad bridges are opened on an average of once a day or less. Some 425 movable highway and railroad bridges were reported as not having been opened for a year or longer.

Statement of Fair Play

The study also revealed a very significant thing, i.e., that while it is true that railroads have been presenting statements at Corps of Engineers hearings on proposed navigation projects, or concerning the establishment of navigational clearances in bridges, the statements generally failed clearly to point out the relationship between added railroad bridge costs due solely to navigational needs and the economic justification of navigation projects. This failure to be specific likewise is true in many of the statements that have been filed by highway interests.

Mr. Royster proceeded to quote a statement by the Mississippi State Highway Department at a Corps of Engineers hearing:

"Since the existing federal laws provide in effect that bridge clearances should be determined by the Corps of Engineers, this department would greatly appreciate a formal expression from your office as to the horizontal and vertical clearances expected to be required on these waterways, together with details of the proposed channel alterations, and highway relocations that might be involved. With this requested information on hand, it should be possible for us to furnish you with an estimate of the effect that the contemplated improvements, if undertaken, would have upon highway transportation development. These figures, when considered with the comparable figures which, it is presumed, you will obtain with respect to railroads, should provide your office with the additional facts needed, in our opinion, to make any recommendation to Congress."

"That statement touches upon the essence of this whole problem," Mr. Royster remarked. "It preaches fair play. On the one hand, it respects the right of the Corps of Engineers, under existing laws, to determine what waterway improvments that agency may recommend for navigational purposes, and what kind of navigational clearances it may require for accommodation of watercraft. On the other hand, it asks the Corps of Engineers to respect the *equal* right of the overland transportation interests to determine how much the navigational clearances that agency requires in bridges will increase overland transportation costs, and to have those figures included in navigation project reports that are submitted to the Congress."

Recent developments indicate that the Corps of Engineers already has begun to recognize the equity of these views.

In October 1954 representatives of the Department of Commerce and of the Corps of Engineers completed lengthy discussions in arriving at a statement of Corps of Engineers views for inclusion in the report. The Corp of Engineers then spelled out to its people a policy that an economic analysis of comparative costs and benefits should be made in bridge-clearance cases. The analysis is used as one part of the study leading to the final decision as to what constitutes an unreasonable obstruction to navigation.

Mr. Royster quoted General E. C. Itschner, assistant chief of engineers in charge of civil works, as follows:

"Some of the data for the analysis originate with the navigational interests, who must analyze the characteristics of waterway commerce passing the intersection in question and determine the resultant damages or losses if certain restrictive clearances are provided.

"Conversely, navigational interests must demonstrate the resulting benefits in terms of dollars to be realized by the provision of clearances proposed by them. The problem resolves itself into one where both land and water transportation interests must fully consider the economic effects of the final decision on the overall economy of the region."

That statement, and the policy directive of the Corps of Engineers, Mr. Royster mentioned as evidence that the Corps of Engineers desires to play fair in arriving at clearance decisions. In the Department of Commerce the feeling is that "at present we stand merely at the beginning in a new era of understanding of fair play policy."

Financial

(*Continued from page 16*)

Frederick Keuthen, vice-president and trust officer, Manufacturers Trust Company, New York, who was nominated by representatives of MP first and refunding mortgage bonds; Walter H. Fincke, assistant vice-president, Savings Banks Trust Company, New York, who was named by representatives of International-Great Northern first mortgage bonds; Isaac B. Grainger, executive vice-president, Chemical Corn Exchange Bank, New York, who was nominated by groups representing MP secured serial and general mortgage bonds; and Walter H. Brown, Jr., a member of the law firm of Wilkie, Owen, Farr, Gallagher & Walton, New York, nominated by representatives of MP convertible and I-GN adjustment bonds.

Before the reorganization plan can be put into effect, it must await a vote of approval by security holders as well as final confirmation by the court. It is anticipated that the ICC will mail ballots to security holders for their vote early in May.

Chihuahua-Pacific. — *Formed by Merger.*—A new Mexican railroad, the Ferrocarril Chihuahua al Pacifico (Chihuahua-Pacific), has been formed by merger of the Ferrocarril Nor-Oeste de Mexico (Mexico North-Western) and the Ferrocarril Kansas City, Mexico y Oriente (Kansas City, Mexico & Orient).

Labor & Wages

L&N Renews Settlement Offer

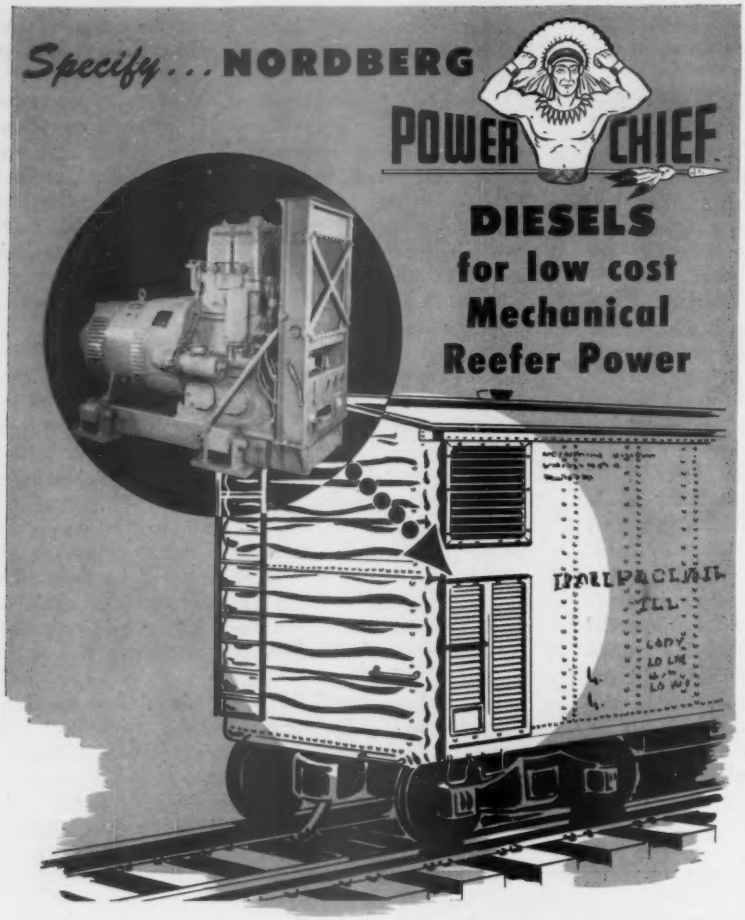
"Ready and anxious to settle differences" with non-ops, strike-tied road again offers five-point plan—More freight services restored—Perishables, livestock, lcl embargoes may be lifted soon, management says

Although, as this issue went to press, non-operating unions were still on strike against the Louisville & Nashville and its affiliates, the L&N has maintained some local freight service throughout the walkout, and on April 9 re-established through freight trains for all carload freight.

While some trains are being manned by supervisory forces, the gradual resumption of through freight services has been due to the return to work of an increasing number of operating crews, a spokesman said. President John E. Tilford anticipated that embargoes might soon be lifted on perishables, livestock and less-carload merchandise. Passenger service, however, remained at a standstill, and little coal moved out of the Kentucky fields.

Negotiations between striking non-ops and affected carriers (L&N; Nashville, Chattanooga & St. Louis; Clinchfield; Atlanta Joint Terminals, Atlanta & West Point; Western of Alabama; Georgia, and Augusta Union Station), continued in Washington, D.C., but at press time there was no indication of their outcome.

Five Plans.—Despite the fact that



HERE are some of the exclusive advantages offered through the use of Nordberg *POWER CHIEF* Diesels for low cost, long life power in mechanically refrigerated cars: *"Inline" layout of all units means easier installation, more space available for routine inspection and maintenance; Easily handles severe starting load without using voltage regulators, field forcing relays, compressor unloaders, or other complicated control devices necessary with most other generating units.*

And remember—the design, operation and service of these husky power units are backed by the builders of America's largest line of heavy duty Diesels—from 10 to over 10,000 H.P.

Nordberg 2 and 3-cylinder *POWER CHIEF* Diesels are built for mechanical refrigeration systems in capacities from 15 to 25 KW. Write for further details . . . and be sure to specify NORDBERG Diesels for your mechanical reefer power needs.

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Milwaukee, Wisconsin

NORDBERG MACHINERY

the road is able to handle an increasing amount of traffic, it remains ready and anxious to settle its differences with national officers of the 10 striking non-operating unions, Mr. Tilford stated. He said the L&N has renewed to them its offers for settlement of the controversy, which include:

- Submission of the L&N's health and welfare insurance plan to three disinterested and responsible insurance companies to ascertain if it is equivalent to the Travelers Company policy which most carriers have signed under the so-called national plan set up by the non-operating unions. Where the L&N's New York Life policy is found inferior to the national plan Travelers policy, it will be brought up to the benefits contained in the latter policy, Mr. Tilford stated.
- Submission to L&N non-operating employees for referendum the question of whether they want the L&N medical-surgical-hospital plan or the compulsory national plan.
- A pay increase of two cents per hour to qualified employees who do not desire to be included in the insurance plan. The increase is equivalent to $3.40 per month, the amount now contributed by the L&N per employee for its policy, which is paid also by those roads subscribing to the national plan.
- Reconvention of the Presidential emergency board on whose recommendations (*Railway Age*, May 24, page 37) the national "fringe" benefit demand case was ultimately settled for most roads (*Railway Age*, August 30, page 7). The board would be asked to ascertain if the L&N and the NC&StL have with their independent health and welfare insurance plans, complied with the board's recommendations. Both parties to the dispute would abide by the board's decision.
- Immediate resumption of operations, with the understanding that any settlement reached would be made retroactive to the date of agreement.

These offers have previously been declined by the brotherhood chiefs. They are renewed, Mr. Tilford said, "seriously and with the earnest desire one or more of them would be acceptable." He said he hoped union officers and employees would consider them not only in the light of their responsibility to themselves and families but also their obligation to perform public transportation as well.

A company spokesman denied union charges that the L&N's insurance setup with New York Life is a "fake" or a "hoax." The company has a firm contract with NYL, but individual policies have not been prepared because, until the issues are settled, it cannot be determined what and how many employees will take them, he explained.

"No Right to Sign"—Earlier, while commenting on the prolonged strike at the annual meeting of L&N stockholders, A. L. M. Wiggins, chairman of the L&N board, said:

"The present conflict is not between management and the interests of our employees. . . . The basic conflict is one of principle and basic convictions as to human rights. The national insurance plan, promoted by union leaders, is mandatory on every non-operating employee—union and non-union alike. . . . Many employees have veterans' benefits or other insurance and do not want to pay for additional insurance they do not need.

"The L&N insurance is optional with each employee. . . . If he takes it, the cost to the employee is $1.85 per month as against $3.40 per month under the union national plan.

"The management of the L&N stands on the principle that it has no right to become a party to any contract or agreement that forces any employee, against his will, to pay any part of his wages for something he does not want. We believe the wages of an employee belong to him. We believe the fruits of a man's labor are his property and that no man, no employer, no organization, other than government itself, has any right to command his property without his consent. We believe this principle is embedded in the Declaration of Independence and the Constitution of the United States, and is a priceless heritage of free Americans. . . . We shall do everything within our power to defend these sacred human rights."

One additional act of violence was reported since *Railway Age's* previous news report (April 11, page 62). An L&N special agent was injured when a bullet was fired into the cab of a locomotive operating between Independence, Ky., and Maurice.

A rock slide which caused a derailment on the Clinchfield south of Erwin, Tenn., was an "Act of God" and not in any way connected with the strike, a company spokesman stated. The slide necessitated an embargo on all traffic through Erwin until service could be restored late on April 12.

Supply Trade

SKF Industries, Inc., has acquired the controlling interest in **Tyson Bearing Corporation,** Massillon, Ohio, manufacturers of tapered roller bearings. Operations will continue under direction of the existing management, headed by **Harry I. Lewis,** president.

Caterpillar Tractor Company has formed a wholly owned subsidiary, **Caterpillar of Australia Pty. Ltd.** The subsidiary will manufacture and sell many products now made by the parent company, as well as replacement parts for the entire Caterpillar line. ["Pty." is an abbreviation for the term "Proprietary"; it means that a company is privately owned, and that shares of its stock are not offered for sale to the public.—EDITOR.]

E. R. BRODEN, who has been elected executive vice-president, SKF Industries, Inc., effective May 1. He was formerly executive vice-president and a director of Carborundum Company.

George P. Millington, district manager of **Gould-National Batteries, Inc.,** at Philadelphia, has been appointed Atlantic regional manager of the industrial division, with the same headquarters.

Paul J. Every has been named assistant general sales manager, **Cummins Engine Company.** For the past two years he has been responsible for activities of the **Cummins Diesel Export Corporation.**

Frederic M. Schaefer, executive vice-president of **Schaefer Equipment Company,** has been elected president, succeeding to the position held by his late father, **Frederic Schaefer.**

R. M. Hollingshead Corporation has appointed the **Brandon Equipment Company,** Chicago, as distribu-

a 30-day trial will convince you that VI-LAN CLEAN is

a "natural" for men who work with diesels and in diesel shops

It does what soap can not do!

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a non-toxic bacteriostat perfected by the Monsanto Chemical Company which exerts a powerful inhibitory action against harmful skin bacteria for 48 hours or more.

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DAMERON enterprises, inc.
427 So. 20th Street
Louisville 3, Kentucky

tor of its products to the railroad industry.

Edward H. D. Gibbs, sales manager, **Heyl & Patterson, Inc.,** Pittsburgh, has been named vice-president, sales.

Douglas Wallace, assistant vice-president, **Graybar Electric Company,** at New York, has been elected vice-president.

Piggyback

GN-SP Pool Piggyback

The Great Northern has received 10 24-ft trailer units for use in its recently inaugurated piggyback service between Seattle, Tacoma and Portland and San Francisco and Los Angeles area points on the Southern Pacific. The two roads have entered a tariff agreement for interchange at Portland and the service is conducted with equipment pooled among participating roads (*Railway Age*, January 31, page 7). Local service between Seattle, Tacoma and Portland also has been established by the GN.

Minimum weight, in both cases is 10,000 lb. The GN has arranged for pickup and delivery service to be handled in all three cities by local contract haulers.

Securities

Chicago, Rock Island & Pacific. —*Calls Preferred Stock.*—The RI has called for redemption May 9 all outstanding shares of its Series "A" preferred stock, at $105.5416 per share ($100 par value, $5 premium and $0.5416 for dividends accrued from April 1, 1955, to redemption date). Funds for the redemption have come through sale of $65 million of income debenture bonds (*Railway Age*, March 14, page 83). Each share of preferred will continue to be convertible to one share of common stock at any time on or before April 29.

Application

WABASH.—To assume liability for $1,530,000 of equipment trust certificates to finance in part purchase of 150 single-door and 100 double-door 50-ton steel box cars from the General American Transportation Corporation at estimated unit prices of $7,576 and $7,926, respectively, and a total estimated cost of $1,929,000. The certificates, dated May 1, would mature in 15 annual installments of $102,000 each. They would be sold by competitive bidding, with interest rates to be fixed by such bidding.

Authorization

SOUTHERN PACIFIC.—To assume liability for $8,400,000 of equipment trust certificates to finance in part purchase of 69 diesel-electric locomotives at an estimated total cost of $11,233,481 (*Railway Age*, March 14, page 83). Division 4 approved sale of the securities at an interest rate of 2⅞% for 99.30—the bid of Halsey, Stuart & Co. and 13 associates—which will make the annual cost of the proceeds to the railroad approximately 3%. The certificates were reoffered to the public at prices yielding from 2.2 to 3%, according to maturity.

Security Price Averages

	April 12	Prev. Week	Last Year
Average price of 20 representative railway stocks	94.34	91.41	62.50
Average price of 20 representative railway bonds	98.77	98.59	94.79

Dividends Declared

LOUISVILLE & NASHVILLE.—$1.25, quarterly, payable June 13 to holders of record May 2.

PIEDMONT & NORTHERN.—$1, quarterly, payable April 20 to holders of record April 5.

CANADIAN COMMISSION SEES NEW RATE-MAKING FREEDOM NECESSARY FOR RAILWAYS

Reform "which will enable railways to grapple more expeditiously and, therefore, more efficiently with the strong and supple competition which confronts them" is claimed as necessary, in the report of the Royal Commission on Agreed Charges in Canada, rendered by Justice W. F. A. Turgeon. As reported in *Railway Age*, April 11, page 8, on the basis of a preliminary announcement, the report recommended relaxing the restrictions surrounding the making of agreed charges by the railroads.

The full report, as since received, indicates that the commission has gained insight to the competitive necessities of the railways to an extent not realized —or not admitted—by previous inquiry bodies in Canada. In general, it agrees with the railways that their present traffic and revenues are not adequate and that they need greater freedom.

"In my opinion [says Justice Turgeon's report] the time has come to do what the Royal Commission on Transportation refrained from doing in 1951 when conditions were very different from those which now exist and sufficient time had not gone by to test the value of what was still looked upon as a most radical and therefore potentially dangerous departure from sound methods of rate-making.

"I take the view that the object to be attained as nearly as possible is to set the railways free—but with the safeguard of certain precautions intended to preserve the rights of other interested parties."

Justice Turgeon goes on to outline the theory of monopoly rate-making as contrasted with the necessities of today's competitive market. "If one bears in mind that motor transport may be profitably operated at ton-mile rates substantially less than the ton-mile rates by rail at the upper end of the rate scale, it is apparent that the truck operator can establish a rate below that quoted by the railway but sufficiently above truck costs to make the service profitable to him. Therefore, while the railway has established these high rates under near monopoly conditions in an effort to reach a satisfactory average revenue from all traffic, the high rated traffic under competitive conditions may move by motor truck at a lower rate."

The report emphasizes the growth of the for-hire trucking industry in Canada, which is represented by 65,000 trucks in 1953, compared with only 16,000 in 1938. These and other figures quoted, according to Justice Turgeon, "show that the trucking business is now one of Canada's largest industries; insofar as the evidence goes, it is more prosperous than the railway industry." And elsewhere: "I think the most striking development to be noted during the last few years is the growth in the size, the efficiency and the prosperity of the trucking industry, on the one hand, and, on the other hand, the great deterioration to be seen in the financial position of the railways despite all they have achieved in the way of improving their property and their services. This railway situation is opposed to the national interest."

The report justifies continuance of the right of the railways to make agreed charges, with fewer restrictions than heretofore, on the ground that freedom is required to enable them to cope more effectively with competition. "I am satisfied that in this case no injustice can be asserted. The proposed changes in the law will probably make things easier for the railways and enable them to secure more business. This is what they are intended to do and is in conformity with the aim of the original legislation. But these changes will merely remove from the railways certain restrictions from which the trucks have always been free and will remain free. There can be nothing unjust in this."

Railway Officers

Baths Heads Susquehanna; Norton Becomes Chairman

Henry K. Norton, president of the New York, Susquehanna & Western, has been elected chairman of the board and Earl L. Keller, vice-president, secretary and treasurer, has been elected vice-chairman of the board. James M. Baths, retired operating vice-president and general manager of the Chicago Great Western, has been elected president and chief executive officer of the NYS&W. Leon Leighton, New York attorney, has been elected general counsel.

Messrs. Norton, Baths and Leighton have been elected members of the executive committee, as have Walter D. Floersheimer and Stanley E. Lawfer. Mr. Floersheimer is senior partner of Sutro Bros. & Co., the largest holder of the road's preferred stock, and Mr. Lawfer is vice-president of A. W. Benkert & Co., which represents the majority of the income bonds.

ALASKA.—R. N. Whitman, division superintendent of the Great Northern at Seattle, Wash., has been appointed general manager of the Alaska Railroad at Anchorage, succeeding **Frank E. Kalbaugh,** who has become general manager of Southern Pacific Pipe Lines, Inc., at Los Angeles.

CENTRAL OF GEORGIA.—Hubert Hawthorn, mechanical engineer at Savannah, Ga., retires April 30, after more than a half century of railroad service.

Charles Bernard Niehaus, land and tax agent at Savannah, retires May 1 under the pension rules of the company, after 49 years of railroad service.

CHESAPEAKE & OHIO.—John R. Cavan, district passenger agent at Richmond, Va., has retired from active service for reasons of health, after 43 years of service. **W. A. Griffith** succeeds Mr. Cavan, with the title of division passenger agent.

CHIHUAHUA-PACIFIC. — Jose Murguia has been appointed general manager of the Chihuahua-Pacific (Ferrocarril Chihuahua al Pacifico), which was recently formed through merger of the Mexico North-Western (Ferrocarril Nor-Oeste de Mexico), and the Kansas City, Mexico & Orient (Ferrocarril Kansas City, Mexico y Oriente). Mr. Murguia was general manager of both former railroads until the merger.

GREAT NORTHERN. — J. W. Kirby has been appointed superintendent of dining cars at Seattle, succeeding **F. W. Albachten,** who has retired after 48 years of service.

Frank D. Wineski has been appointed district storekeeper at Jackson Street store, St. Paul, succeeding **H. W. Clifford,** who retired April 1 after 48 years of service.

GREAT NORTHERN.—R. A. Johnson who has been promoted to superintendent signals at St. Paul (*Railway Age*, February 28, page 38).

W. P. Coliton, division superintendent at Klamath Falls, Ore., has been transferred to Seattle, succeeding **R. N. Whitman,** who has been granted a leave of absence to become general manager of the Alaska Railroad at Anchorage. Mr. Coliton's successor is **R. H. Hemmesch,** who has been transferred from Grand Forks, N.D. **R. H. Shober,** Cascade division trainmaster, replaces Mr. Hemmesch.

MISSOURI - KANSAS - TEXAS. — Charles T. Williams, superintendent, Northern division, at Parsons, Kan., has been appointed to the newly created position of assistant vice-president and general manager, at Dallas, Tex., effective April 16. **O. L. Crain,** superintendent of the North Texas division at Denison, Tex., has been transferred to the Northern division at Parsons, to succeed Mr. Williams. **Raymond B. George,** assistant superintendent on the Northern division at Franklin, Mo., succeeds Mr. Crain as superintendent of the North Texas division.

NATIONAL OF MEXICO.— R. C. Rodriguez has been appointed superintendent of electricity and telegraph at Mexico, D. F., succeeding **B. E. Arias,** promoted.

NEWBURGH & SOUTH SHORE. —R. E. Butler, vice-president at Cleveland, retired March 31, after more than 39 years of service.

NEW YORK CENTRAL.—Floyd S. Trudeau, assistant general passenger agent at Chicago, retired March 31.

RUTLAND.—Ralph L. Andreas, assistant freight traffic manager of the Illinois Central at Chicago, has been appointed assistant to president of the Rutland at Rutland, Vt.

Sidney M. Rodgers, general manager at Rutland, has been appointed vice-president—operations, with jurisdiction over transportation, maintenance of way and maintenance of equipment departments. Mr. Rodgers joined the Rutland in 1951 as general manager, which position has been abolished. Prior to joining the Rutland, Mr. Rodgers served in various operating executive capacities with the Pennsylvania for 16 years.

Ralph L. Andreas

Sidney M. Rodgers

SOUTHERN PACIFIC. — Frank E. Kalbaugh, general manager of the Alaska Railroad, has been appointed general manager of Southern Pacific Pipe Lines, Inc., at Los Angeles.

D. E. Porter, industrial agent at Los Angeles, has been transferred to San Francisco.

OBITUARY

George H. Sido, 67, vice-president —operations, of the **Wabash** and the **Ann Arbor** at St. Louis, died March 30 in that city.

J. W. Hopkins, engineer of track of the **Bessemer & Lake Erie** at Greenville, Pa., died April 4 at Birmingham, Ala.

John Kenneth Savage, 78, who retired in 1942 as general superintendent of the Quebec district of the **Canadian Pacific** at Montreal, died recently at Daytona Beach, Fla.

Freight Operating Statistics of Large Steam Railways—Selected Items

Region, Road and Year		Miles of road operated	Train-miles	Locomotive-Miles: Principal and helper	Locomotive-Miles: Light	Car-Miles: Loaded (thousands)	Car-Miles: Per cent loaded	Ton-miles (thousands: Gross excl. locos & tenders	Ton-miles (thousands: Net rev. and non-rev.	Road-locos. on line: Serviceable: Unstored	Road-locos. on line: Serviceable: Stored	Road-locos. on line: B.O.	Road-locos. on line: per cent B.O.
New Eng. Region	Boston & Maine	1955	1,564	239,688	245,546	9,591	63.6	603,950	235,772	69	1	6	7.9
		1954	1,665	246,281	251,667	9,370	65.5	604,047	236,088	75	1	4	5.0
	N. Y., N. H. & Htfd.	1955	1,746	263,439	263,521	20,655	66.2	669,201	266,647	86	..	5	5.5
		1954	1,748	275,755	275,774	20,340	66.4	682,969	280,511	88	..	6	6.4
Great Lakes Region	Delaware & Hudson	1955	792	185,736	191,342	10,346	63.3	634,281	314,337	37	2	3	7.1
		1954	793	192,943	198,729	11,069	65.0	642,417	319,896	41	..	2	4.7
	Del., Lack. & Western	1955	962	277,818	292,897	21,034	63.9	797,731	336,275	64	..	..	..
		1954	962	263,957	278,900	21,292	66.9	738,651	318,241	62	..	3	4.6
	Erie	1955	2,224	530,698	536,692	15,997	68.1	1,786,607	712,802	161	..	3	1.8
		1954	2,224	518,515	522,053	22,968	68.3	1,754,195	696,925	168	..	1	.6
	Grand Trunk Western	1955	952	256,488	262,032	2,117	57.7	616,320	243,650	57	4	16	20.8
		1954	952	256,229	262,445	2,066	60.1	583,453	240,288	67	3	9	11.4
	Lehigh Valley	1955	1,142	204,060	207,522	6,042	64.1	668,422	292,866	33	..	1	2.9
		1954	1,150	209,086	212,270	9,163	67.4	651,697	284,888	30	3	1	2.9
	New York Central	1955	10,661	2,506,501	2,544,734	103,969	58.4	7,043,787	2,960,438	539	124	86	11.5
		1954	10,663	2,426,625	2,470,752	104,910	59.6	6,794,374	2,934,490	638	87	138	16.0
	New York, Chic. & St. L.	1955	2,155	699,537	720,433	6,445	57.1	27,187	61.9	1,922,106	826,094	140	30
		1954	2,161	686,771	707,139	6,781	63.1	26,671	63.1	1,894,190	771,533	177	39
	Pitts. & Lake Erie	1955	221	58,876	58,936	....	59.9	2,470	59.9	224,197	133,424	15	7
		1954	221	60,128	60,659	....	60.9	2,467	60.9	218,137	128,974	17	11
	Wabash	1955	2,381	515,468	517,267	6,649	65.0	22,601	65.0	1,427,267	551,744	103	..
		1954	2,381	514,828	516,162	6,814	65.7	22,249	65.7	1,427,114	544,333	107	..
Central Eastern Region	Baltimore & Ohio	1955	6,077	1,435,906	1,560,886	128,536	59.9	56,139	59.9	4,270,475	1,962,181	412	62
		1954	6,077	1,448,952	1,591,688	167,010	57.3	53,406	57.3	4,292,016	1,987,736	463	88
	Bessemer & Lake Erie	1955	208	30,050	30,396	44	73.4	1,224	73.4	126,708	84,305	9	5
		1954	209	43,319	43,330	196	61.0	1,523	61.0	162,566	99,061	12	3
	Central RR Co. of New Jersey	1955	613	122,310	123,209	5,214	62.7	4,494	62.7	343,028	175,808	63	1
		1954	614	122,969	127,340	9,654	64.8	4,683	64.8	358,327	187,751	67	2
	Chicago & Eastern Ill.	1955	868	139,978	139,978	3,734	64.8	6,239	64.8	437,303	226,976	27	..
		1954	868	118,017	118,017	2,561	64.2	4,653	64.2	327,515	157,740	24	..
	Elgin, Joliet & Eastern	1955	236	75,758	76,293	....	63.1	2,446	63.1	195,915	106,709	33	7
		1954	236	88,036	88,331	....	62.9	2,666	62.9	213,234	112,610	35	5
	Pennsylvania System	1955	9,892	2,676,017	2,842,705	192,082	61.2	110,666	61.2	7,986,140	3,541,547	704	248
		1954	9,906	2,571,878	2,751,770	228,312	61.5	105,682	61.5	7,616,171	3,392,338	814	324
	Reading	1955	1,304	334,457	337,755	12,267	58.3	12,135	58.3	1,018,548	519,462	159	15
		1954	1,301	322,597	328,949	14,767	60.6	12,103	60.6	968,507	496,561	182	35
	Western Maryland	1955	847	149,041	154,184	8,595	60.1	5,359	60.1	450,187	244,092	34	..
		1954	857	157,104	168,900	12,596	63.5	6,013	63.5	497,263	277,838	69	20
Pocahontas Region	Chesapeake & Ohio	1955	5,063	1,329,502	1,349,799	40,111	57.2	54,023	57.2	4,578,196	2,496,553	349	49
		1954	5,023	1,193,584	1,215,999	31,221	56.2	48,026	56.2	4,057,810	2,167,773	364	111
	Norfolk & Western	1955	2,110	649,917	694,376	55,023	57.8	29,878	57.8	2,774,442	1,496,127	217	28
		1954	2,113	611,662	646,718	43,044	58.4	27,067	58.4	2,399,677	1,270,555	223	31
Southern Region	Atlantic Coast Line	1955	5,334	846,869	846,869	8,893	57.2	26,375	57.2	1,943,277	844,659	237	..
		1954	5,354	785,602	785,605	9,055	59.0	25,993	59.0	1,882,268	823,803	239	..
	Central of Georgia	1955	1,731	188,667	188,692	2,049	68.5	7,751	68.5	527,544	253,007	72	..
		1954	1,754	190,704	190,730	2,141	67.4	7,238	67.4	494,335	233,507	71	..
	Gulf, Mobile & Ohio	1955	2,717	274,239	274,239	204	68.0	14,873	68.0	1,005,858	468,777	82	..
		1954	2,718	289,151	289,151	269	65.5	15,770	65.5	1,087,722	496,886	82	..
	Illinois Central	1955	6,539	1,240,748	1,242,929	40,379	63.0	48,943	63.0	3,493,103	1,588,078	445	90
		1954	6,537	1,338,614	1,391,162	47,309	62.2	50,008	62.2	3,610,983	1,641,585	509	45
	Louisville & Nashville	1955	4,715	859,790	865,107	17,093	61.9	32,497	61.9	2,441,418	1,224,919	175	43
		1954	4,728	931,067	970,760	19,595	62.8	32,792	62.8	2,448,844	1,234,168	246	40
	Nash., Chatt. & St. Louis	1955	1,043	172,436	176,700	4,411	70.4	5,789	70.4	375,066	174,752	49	..
		1954	1,032	184,811	190,078	4,290	66.6	6,106	66.6	410,855	188,069	50	..
	Seaboard Air Line	1955	4,053	634,277	634,277	1,659	62.8	25,841	62.8	1,864,827	831,989	138	..
		1954	4,067	628,183	628,183	1,835	62.0	25,197	62.0	1,832,929	801,482	142	..
	Southern	1955	6,264	942,207	942,257	12,427	65.1	41,992	65.1	2,772,313	1,234,820	272	..
		1954	6,262	932,957	933,014	11,746	66.1	39,186	66.1	2,575,794	1,154,837	257	5
Northwestern Region	Chicago & North Western	1955	7,848	692,469	694,178	9,792	65.2	29,491	65.2	1,979,519	899,475	140	33
		1954	7,850	649,589	651,803	12,756	64.3	27,198	64.3	1,849,738	843,138	181	43
	Chicago Great Western	1955	1,437	132,680	132,680	192	67.0	7,519	67.0	507,668	227,103	29	..
		1954	1,437	133,690	133,690	216	65.4	7,327	65.4	497,026	215,449	32	..
	Chic., Milw., St. P. & Pac.	1955	10,633	973,534	986,226	19,084	62.9	40,644	62.9	2,817,066	1,241,607	261	64
		1954	10,631	957,356	976,909	26,359	64.5	37,739	64.5	2,552,791	1,117,844	345	63
	Chic., St. P., Minn. & Omaha	1955	1,606	164,114	165,313	4,685	65.1	5,484	65.1	384,423	157,633	58	1
		1954	1,606	164,858	166,562	5,560	61.7	5,149	61.7	369,771	156,398	54	7
	Duluth, Missabe & Iron Range	1955	569	31,785	31,785	162	53.9	627	53.9	50,169	23,772	29	30
		1954	569	37,299	37,754	658	54.5	599	54.5	46,009	22,008	28	29
	Great Northern	1955	8,288	1,064,200	1,070,408	29,438	66.9	37,737	66.9	2,677,403	1,247,115	218	175
		1954	8,293	1,037,381	1,043,254	35,014	66.5	33,732	66.5	2,357,988	1,071,675	295	137
	Minneap., St. P. & S. Ste. M.	1955	4,171	374,441	376,433	2,861	67.4	11,860	67.4	789,902	359,800	91	2
		1954	4,169	368,061	369,895	3,813	68.7	10,482	68.7	665,887	307,019	91	11
	Northern Pacific	1955	6,570	870,257	894,834	23,400	62.5	32,934	62.5	2,354,232	1,029,610	279	24
		1954	6,570	805,776	829,574	34,413	67.6	28,490	67.6	1,963,838	881,320	320	34
Central Western Region	Atch., Top. & S. Fe (incl. G. C. & S. F. and P. & S. F.)	1955	13,098	2,219,057	2,320,142	49,745	102,292	63.8	6,863,041	2,573,925	508	89	40	6.3
		1954	13,070	2,227,166	2,262,178	52,968	95,680	63.1	6,520,416	2,485,091	523	166	35	4.8
	Chic., Burl. & Quincy	1955	8,824	1,131,941	1,128,781	34,194	45,493	65.7	3,020,198	1,318,358	251	49	40	11.8
		1954	8,832	1,125,813	1,129,561	34,173	45,777	64.4	3,111,191	1,364,514	269	90	41	10.3
	Chic., Rock I. & Pac.	1955	7,907	882,695	876,660	1,474	34,792	61.3	2,477,021	1,007,845	166	..	9	5.1
		1954	7,866	883,205	881,722	6,563	34,146	60.5	2,444,708	984,808	170	1	12	6.6
	Denver & R. G. Wn.	1955	2,165	281,920	300,677	31,344	13,129	70.1	916,712	443,608	60	45	22	17.3
		1954	2,167	248,791	265,592	22,299	11,839	70.1	818,696	393,871	58	54	26	18.8
	Southern Pacific	1955	8,072	2,007,321	2,107,733	226,405	88,016	64.4	6,008,959	2,487,659	562	79	122	16.0
		1954	8,065	1,813,514	1,894,619	219,568	80,626	64.1	5,535,868	2,288,053	559	137	127	15.4
	Union Pacific	1955	9,813	2,286,211	2,333,487	106,557	101,099	65.7	6,673,394	2,787,153	392	251	127	16.5
		1954	9,821	2,313,033	2,377,058	137,861	95,360	65.1	6,469,888	2,720,371	523	194	136	15.9
	Western Pacific	1955	1,190	204,128	215,583	10,635	9,387	71.5	608,406	283,544	39	3	..	..
		1954	1,190	199,085	200,914	12,179	8,598	72.3	558,323	263,232	34	9	2	4.4
Southwestern Region	International-Gt. Northern*	1955	1,104	136,610	136,610	....	5,505	64.2	401,085	178,842	41	..	2	4.7
		1954	1,103	141,174	141,174	....	5,135	63.1	367,424	164,953	56	..	2	3.5
	Kansas City Southern	1955	886	143,653	143,805	223	8,156	66.6	579,649	260,097	25	..	3	10.7
		1954	886	143,285	143,323	388	7,571	65.1	534,352	239,217	25	..	1	3.8
	Mo.-Kans.-Texas Lines	1955	3,229	355,221	355,221	3,953	13,945	63.9	904,023	362,077	84	..	..	..
		1954	3,230	346,933	346,933	4,030	13,561	63.5	887,155	373,420	84	..	1	1.2
	Missouri Pacific*	1955	6,896	961,799	961,799	10,697	42,601	64.7	2,918,351	1,263,626	209	40	89	26.3
		1954	6,904	1,127,426	1,129,429	13,356	45,161	64.6	3,076,087	1,311,543	257	30	98	25.5
	Texas & Pacific	1955	1,822	349,856	349,856	3,572	15,011	57.6	1,133,204	401,824	60	..	2	3.2
		1954	1,827	323,996	323,996	3,144	14,769	62.2	1,054,207	387,399	62	..	..	..
	St. Louis-San Francisco	1955	4,564	593,593	593,593	5,595	23,567	64.2	1,592,942	691,743	111	..	5	4.3
		1954	4,564	626,713	628,323	6,009	24,238	64.0	1,634,543	705,552	124	..	4	3.1
	St. Louis Southw. Lines	1955	1,554	298,695	298,748	1,440	14,676	66.2	928,056	414,854	54	5	12	16.9
		1954	1,555	302,954	302,986	4,100	14,641	67.6	925,422	413,677	53	14	5	6.9
	Texas & New Orleans	1955	4,302	675,539	675,539	17,397	26,700	62.0	1,879,281	773,716	132	..	5	3.6
		1954	4,279	697,660	697,660	11,627	28,018	63.8	1,936,744	805,611	163	..	38	18.9

For the Month of January 1955 Compared with January 1954

Region, Road and Year		Freight cars on line: Home	Foreign	Total	Per Cent B.O.	G.t.m.per train-hr. excl.locos and tenders	G.t.m.per train-mi. excl.locos and tenders	Net ton-mi. per train-mile	Net ton-mi. per l'd car-mile	Net ton-mi. per car-day	Car-miles per car-day	Net daily ton-mi. per road-mi.	Train-miles per train-hour	Miles per loco. per day
New Eng. Region	Boston & Maine 1955	2,846	7,407	10,253	5.6	40,111	2,525	986	25.8	749	45.6	4,863	15.9	121.7
	1954	2,543	7,732	10,275	2.9	40,067	2,458	961	25.4	781	46.9	4,574	16.3	115.2
	N. Y., N. H. & Htfd 1955	3,116	12,913	16,029	3.5	44,300	2,540	1,012	24.8	549	33.4	4,926	17.4	122.3
	1954	2,885	13,443	16,328	2.1	40,997	2,477	1,017	26.2	525	33.7	5,177	16.6	122.6
Great Lakes Region	Delaware & Hudson 1955	7,271	3,879	11,150	7.5	63,728	3,434	1,702	35.4	908	40.5	12,803	18.7	162.6
	1954	6,693	4,009	10,702	6.2	61,084	3,348	1,667	35.3	931	40.7	13,013	18.3	167.4
	Del., Lack. & Western 1955	7,983	9,452	17,435	3.0	53,090	2,915	1,229	28.4	609	33.6	11,276	18.5	173.2
	1954	8,031	8,788	16,819	3.7	49,647	2,844	1,225	28.2	605	32.1	10,671	17.7	165.5
	Erie 1955	11,254	14,739	25,993	5.4	66,178	3,397	1,355	24.5	860	51.5	10,339	19.7	122.1
	1954	12,089	13,000	25,089	4.5	63,267	3,410	1,355	24.4	873	52.3	10,109	18.7	114.7
	Grand Trunk Western 1955	4,102	8,435	12,537	5.8	52,217	2,420	957	29.1	616	36.7	8,256	21.7	117.4
	1954	3,894	8,490	12,384	4.2	48,812	2,294	945	29.2	663	37.8	8,142	21.4	117.4
	Lehigh Valley 1955	10,046	6,633	16,679	3.7	68,902	3,298	1,445	29.7	569	29.9	8,273	21.0	215.6
	1954	8,684	7,369	16,053	4.9	65,111	3,153	1,378	28.1	571	30.1	7,991	20.9	223.1
	New York Central 1955	78,429	74,050	152,479	8.2	50,755	2,851	1,198	30.5	630	35.4	8,958	18.1	122.2
	1954	93,265	73,223	166,488	9.8	49,409	2,846	1,229	31.1	589	31.8	8,878	17.6	107.4
	New York, Chic. & St. L. 1955	9,421	13,851	23,272	8.5	50,805	2,792	1,200	30.4	1,124	59.7	12,366	18.5	122.2
	1954	11,574	12,768	24,342	5.9	51,964	2,790	1,137	28.9	1,122	61.4	11,517	18.8	101.1
	Pitts. & Lake Erie 1955	10,592	4,703	15,295	9.3	56,615	3,842	2,287	54.0	295	9.1	19,475	14.9	100.6
	1954	8,917	6,137	15,054	4.7	57,617	3,630	2,146	52.3	278	8.8	18,826	15.9	63.5
	Wabash 1955	8,888	10,530	19,418	7.3	64,036	2,845	1,076	24.4	931	58.7	7,475	22.6	173.4
	1954	9,490	10,751	20,241	8.3	65,545	2,789	1,064	24.5	886	55.1	7,375	23.6	143.3
Central Eastern Region	Baltimore & Ohio 1955	58,451	36,741	95,192	14.5	48,254	3,007	1,382	35.0	671	32.0	10,416	16.2	98.5
	1954	56,424	38,208	94,632	5.7	47,079	2,997	1,388	37.2	667	31.2	10,551	15.9	91.6
	Bessemer & Lake Erie 1955	6,575	590	7,165	20.9	60,597	4,406	2,932	68.9	373	7.4	13,075	14.4	81.6
	1954	8,140	455	8,595	10.2	64,078	3,933	2,397	65.0	368	9.3	15,290	17.1	96.5
	Central RR Co. of New Jersey 1955	5,771	9,021	14,792	11.9	40,890	2,917	1,495	39.1	380	15.5	9,252	14.6	82.6
	1954	4,924	8,539	13,463	10.8	40,961	3,061	1,604	40.1	450	17.3	9,864	14.1	74.2
	Chicago & Eastern Ill. 1955	2,793	2,734	5,527	7.2	55,488	3,135	1,627	36.4	1,247	52.9	8,435	17.8	168.7
	1954	2,925	2,820	5,745	6.4	48,978	2,785	1,341	33.9	840	38.6	5,862	17.6	156.0
	Elgin, Joliet & Eastern 1955	8,130	6,608	14,738	9.2	23,251	2,712	1,477	43.6	237	8.6	14,586	9.0	77.0
	1954	7,115	8,657	15,772	5.6	21,506	2,531	1,337	42.2	226	8.5	15,392	8.9	91.8
	Pennsylvania System 1955	116,649	87,160	203,809	14.6	54,022	3,060	1,357	32.0	560	28.6	11,549	18.1	77.7
	1954	109,824	94,881	204,705	8.1	52,946	3,052	1,359	32.1	534	27.0	11,047	17.9	70.7
	Reading 1955	21,101	13,187	34,288	6.3	46,953	3,047	1,554	42.8	470	18.8	12,850	15.4	68.4
	1954	19,153	14,938	34,091	5.3	42,780	3,004	1,540	41.0	462	18.6	12,312	14.2	58.7
	Western Maryland 1955	8,332	2,242	10,574	2.2	45,354	3,075	1,668	45.5	706	25.8	9,296	15.0	170.2
	1954	7,384	2,603	9,987	3.9	44,819	3,198	1,787	46.2	857	29.2	10,458	14.2	65.5
Pocahontas Region	Chesapeake & Ohio 1955	56,148	25,737	81,885	4.9	65,510	3,462	1,888	46.2	975	36.9	15,906	19.0	81.6
	1954	56,902	18,382	75,284	3.6	64,152	3,415	1,824	45.1	907	35.7	13,922	18.9	71.1
	Norfolk & Western 1955	38,175	6,440	44,615	2.1	73,753	4,416	2,381	50.1	1,065	36.8	22,873	17.3	96.4
	1954	40,173	6,321	46,494	1.8	69,293	3,989	2,112	46.9	876	31.9	19,397	17.7	87.8
Southern Region	Atlantic Coast Line 1955	21,568	14,743	36,311	3.4	41,199	2,303	1,001	32.0	736	40.2	5,108	18.0	126.2
	1954	21,470	14,883	36,353	2.0	41,210	2,411	1,055	31.7	717	38.3	4,963	17.2	116.4
	Central of Georgia 1955	3,566	5,538	9,104	4.7	49,928	2,803	1,344	32.6	932	41.7	4,715	17.9	91.6
	1954	4,119	5,050	9,169	2.6	46,513	2,602	1,229	32.3	876	40.3	4,294	17.9	96.5
	Gulf, Mobile & Ohio 1955	6,489	8,508	14,997	2.9	75,154	3,673	1,712	31.5	1,018	47.5	5,566	20.5	106.9
	1954	6,503	9,371	15,874	4.1	75,041	3,766	1,720	31.5	1,014	49.1	5,897	19.9	112.4
	Illinois Central 1955	29,079	20,992	50,071	2.5	48,474	2,849	1,295	32.4	1,023	50.1	7,834	17.2	66.0
	1954	32,668	21,298	53,966	3.0	44,910	2,640	1,200	32.8	981	48.0	8,101	17.3	78.1
	Louisville & Nashville 1955	35,372	11,880	47,252	4.4	50,602	2,847	1,429	37.7	810	34.7	8,380	17.8	116.8
	1954	37,717	12,172	49,889	2.9	46,129	2,638	1,330	37.6	781	33.0	8,420	17.5	100.0
	Nash., Chatt. & St. Louis 1955	4,070	2,904	6,974	3.1	44,276	2,180	1,016	30.2	808	38.0	5,405	20.4	118.1
	1954	4,312	3,770	8,082	1.9	44,678	2,226	1,019	30.8	771	37.6	5,879	20.1	126.6
	Seaboard Air Line 1955	14,653	12,735	27,388	2.8	54,750	2,983	1,331	32.2	953	47.1	6,622	18.6	163.8
	1954	14,008	13,791	27,799	2.4	53,518	2,958	1,294	31.8	934	47.4	6,357	18.3	161.5
	Southern 1955	18,560	22,963	41,523	4.9	51,250	2,952	1,315	29.4	939	49.0	6,359	17.4	122.6
	1954	20,601	22,354	42,955	3.0	48,213	2,775	1,244	29.5	880	45.2	5,949	17.5	134.8
Northwestern Region	Chicago & North Western 1955	18,398	27,377	45,775	4.4	51,794	2,921	1,327	30.5	659	33.1	3,697	18.1	110.5
	1954	21,942	24,764	46,706	5.8	49,530	2,913	1,328	31.0	590	29.6	3,465	17.4	76.4
	Chicago Great Western 1955	2,050	3,778	5,828	3.4	74,145	3,833	1,715	30.2	1,217	60.2	5,098	19.4	135.3
	1954	2,355	3,643	5,998	3.5	72,211	3,731	1,618	29.4	1,178	61.3	4,843	19.4	136.8
	Chic., Milw., St. P. & Pac. 1955	36,158	29,290	65,448	6.0	55,686	2,906	1,281	30.5	617	32.1	3,767	19.2	104.0
	1954	36,572	26,914	63,486	5.6	48,455	2,680	1,174	29.6	564	29.5	3,392	18.2	78.4
	Chic., St. P., Minn. & Omaha 1955	1,186	7,527	8,713	5.2	34,287	2,364	969	28.7	621	33.2	3,166	14.6	75.0
	1954	1,195	7,149	8,344	5.1	34,506	2,266	958	30.4	615	32.8	3,141	15.4	75.8
	Duluth, Missabe & Iron Range 1955	14,643	761	15,404	1.9	22,487	1,705	808	37.9	50	2.5	1,348	14.2	18.6
	1954	14,869	732	15,601	3.4	19,299	1,322	632	36.7	46	2.3	1,248	15.6	17.6
	Great Northern 1955	23,914	18,559	42,473	3.4	51,398	2,533	1,180	33.0	955	43.2	4,854	20.4	87.7
	1954	26,606	18,990	45,596	4.3	40,118	2,299	1,045	31.8	787	37.3	4,169	17.6	78.6
	Minneap., St. P. & S. Ste. M. 1955	7,462	7,486	14,948	5.8	44,685	2,124	967	30.3	764	37.3	2,783	21.2	111.3
	1954	7,344	6,542	13,886	6.3	36,449	1,817	838	29.3	722	35.9	2,376	20.1	110.5
	Northern Pacific 1955	21,634	16,161	37,795	5.3	53,751	2,727	1,192	31.3	896	45.9	5,055	19.9	88.3
	1954	23,771	12,848	36,619	5.6	44,571	2,456	1,102	30.9	765	36.6	4,327	18.3	72.0
Central Western Region	Atch., Top. & S. Fe (incl. G. C. & S. F. and P. & S. F.) 1955	57,924	30,367	88,291	3.7	73,654	3,102	1,163	25.2	929	57.9	6,339	23.8	126.7
	1954	56,937	35,340	92,277	2.6	69,821	2,936	1,119	26.0	885	54.0	6,133	23.8	109.0
	Chic., Burl. & Quincy 1955	23,456	21,502	44,958	2.9	56,906	2,675	1,168	29.0	942	49.5	4,820	21.3	117.0
	1954	21,859	21,120	42,979	3.1	56,970	2,768	1,214	29.8	1,009	52.6	4,984	20.6	99.5
	Chic., Rock I. & Pac. 1955	14,632	16,796	31,428	5.7	57,010	2,813	1,145	29.0	1,027	57.8	4,112	20.3	170.4
	1954	13,404	20,692	34,096	3.6	55,367	2,772	1,117	28.8	926	53.1	4,039	20.0	165.6
	Denver & R. G. Wn. 1955	8,036	5,974	14,010	3.7	60,891	3,257	1,576	33.8	1,019	43.0	6,610	18.7	86.6
	1954	8,335	4,286	12,621	3.0	60,514	3,301	1,588	33.3	992	42.6	5,863	18.4	67.7
	Southern Pacific 1955	34,224	38,082	72,306	2.0	58,419	3,027	1,253	28.2	1,123	61.7	9,941	19.5	106.6
	1954	34,982	31,609	66,591	1.8	59,483	3,085	1,275	28.4	1,108	60.9	9,152	19.5	86.9
	Union Pacific 1955	33,747	30,654	64,401	2.8	80,095	2,957	1,235	27.6	1,410	77.8	9,162	27.4	103.9
	1954	34,370	26,375	60,745	2.4	70,899	2,827	1,189	28.5	1,425	76.8	8,935	25.3	99.5
	Western Pacific 1955	2,507	2,917	5,424	2.5	77,336	3,002	1,399	30.2	1,668	77.2	7,686	25.9	177.0
	1954	2,549	2,058	4,607	7.0	72,434	2,825	1,332	30.6	1,753	79.2	7,136	25.8	162.7
Southwestern Region	International-Gt. Northern* 1955	1,028	5,494	6,522	3.9	63,644	2,948	1,314	32.5	917	43.9	5,225	21.7	106.6
	1954	942	6,102	7,044	3.0	54,684	2,611	1,172	32.1	750	37.0	4,824	21.0	90.7
	Kansas City Southern 1955	1,225	5,780	7,005	3.3	85,836	4,057	1,820	31.9	1,219	57.4	9,470	21.3	196.4
	1954	1,293	5,557	6,850	2.1	75,612	3,735	1,672	31.6	1,111	54.0	8,710	20.3	207.5
	Mo.-Kans.-Texas Lines 1955	5,386	5,928	11,314	9.4	56,914	2,554	1,023	26.0	1,016	61.2	3,617	22.4	147.6
	1954	5,645	6,191	11,836	5.6	54,749	2,564	1,079	27.5	1,021	58.3	3,729	21.4	151.8
	Missouri Pacific* 1955	21,017	17,316	38,333	2.7	70,310	3,045	1,319	29.7	1,059	55.2	5,911	23.2	101.5
	1954	20,082	14,562	34,644	2.9	62,200	2,737	1,167	29.0	1,299	69.2	6,128	22.8	103.1
	Texas & Pacific 1955	3,482	6,045	9,527	2.3	73,190	3,248	1,152	26.8	1,343	87.2	7,114	22.6	194.6
	1954	3,713	6,437	10,150	3.8	75,635	3,259	1,198	26.2	1,235	75.7	6,840	23.2	180.2
	St. Louis-San Francisco 1955	15,005	10,403	25,408	2.4	54,281	2,688	1,167	29.4	883	46.8	4,889	20.2	182.7
	1954	16,964	12,026	28,990	2.4	49,305	2,613	1,128	29.1	750	40.3	4,987	18.9	140.0
	St. Louis Southw. Lines 1955	2,464	4,487	6,951	1.9	65,964	3,114	1,392	28.3	1,927	102.9	8,612	21.2	150.9
	1954	2,703	4,459	7,162	1.7	63,831	3,057	1,366	28.3	1,859	97.3	8,582	20.9	144.3
	Texas & New Orleans 1955	6,754	14,964	21,718	2.3	59,831	2,801	1,153	29.0	1,063	59.2	5,802	21.5	156.7
	1954	7,479	15,116	22,595	1.8	56,854	2,794	1,162	28.8	1,160	63.3	6,073	20.5	116.1

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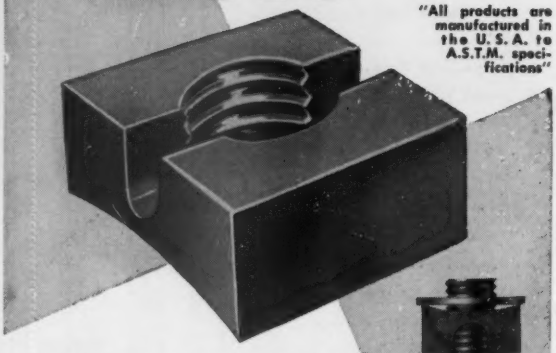

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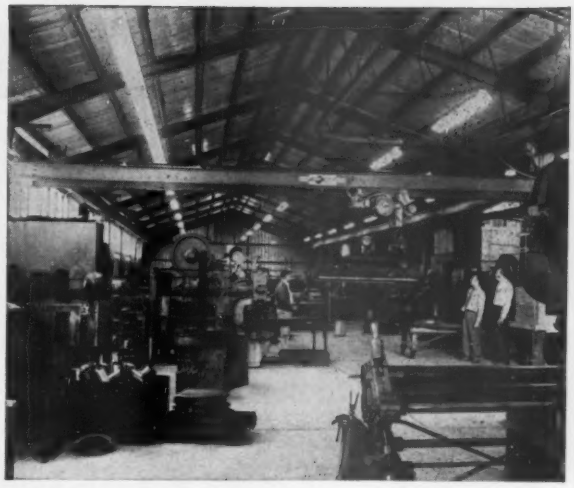

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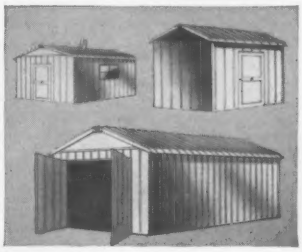

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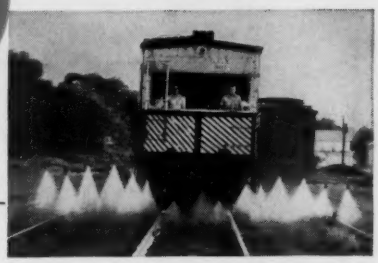

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